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ABSTRACT

The document contains summaries of recently completed, current, or projected research from Gallaudet College on the social and cultural aspects of deafness, language and communication, and educational research. Among the issues addressed by the research are the following: deafness in media, relationship between deaf students and their parents in the development of occupational goals, assessment of emotional and social behaviors in deaf children, attitudes toward deafness, the Gallaudet/Oberin College student exchange program, adaptive speech testing applied to hearing impaired listeners, basic considerations in standard error calculations for speech discrimination tests, captioning methodologies for enhanced reading level and vocabulary development, deaf children's understanding of English metaphor, ability of hearing impaired children to comprehend the semantics of English prepositions, an automated newborn hearing screening test, language proficiency and creativity in hearing impaired adolescents, perception of complex auditory stimuli by the deaf, effect of presentation mode and time on word associations in deaf subjects, phonology and language of preschool children, comparisons of sign language grammatical structure, intrapersonal variables and characteristics of interactions between change agent and client, cyclic patterns of interaction in the discourse of beginning teachers, the use of the cloze procedure as a measure of readability for deaf students, residential schools for deaf students, creativity and self concept of mentally retarded adolescents, visual rhythms as an aid to reading, mental health service in programs for hearing impaired children, and peripheral visual attention in deaf and hearing subjects. Also included is a listing and description of books in progress. (SBH)

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Recent, Current, and Projected Research at Gallaudet

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Directions

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Purpose

Directions is a publication of Gallaudet College intended to provide professionals in the field of deafness with information perceived as important to the education and welfare of deaf persons. *Directions* is a vehicle for disseminating outstanding ideas, important papers, validated experience and research findings—primarily originating on Kendall Green—viewed to be of interest to the profession at large. It will update significant progress in academic, professional development, career and research areas. The goals of the publication are to: (1) foster the continuing development of theory and practice, and (2) encourage extensive and thorough discussion of problems related to and/or drawn from such innovation.

Information for Authors

Each issue of *Directions* will deal with a single topic identified as having interest to the profession at large. *Directions* issues generally are planned by editors and/or guest editors many months in advance and most of the articles are solicited from persons who have published original work on the topic. However, from time to time the journal will solicit manuscripts on a particular topic from individuals outside the College community, either directly or through a call for papers. Manuscripts and editorial correspondence should be sent to Doin E. Hicks, Editor, *Directions*, Gallaudet College, Washington, D.C., 20002.

Manuscripts. An original and two copies should be submitted for publication consideration. The manuscript should be typed—on 216 x 280mm heavy duty, white bond paper—double spaced, with margins of at least 38mm at top, bottom and

left, and 25mm at right. Pages should be numbered consecutively in the upper right-hand corner of each page. Page 1 of the original and one copy of the manuscript should include (1) the title of the article, (2) the names (without degrees) and institutional affiliations of all authors, and (3) the name, address, and telephone numbers of the author to whom editorial correspondence should be addressed.

Page 2 of the manuscript should contain an abstract not to exceed 200 words. The abstract should begin with reference to the subject of the article. The abstract should convey to the reader as much information as possible about highlights of the manuscript.

The text or body of the manuscript should begin on page 3. In this section, the liberal use of major headings and subheadings is recommended. First-level headings designate the major divisions of the paper. Usually no more than three heading levels should be used. Descriptive headings are recommended. Use of abbreviations, italics, and parenthetical statements is discouraged. The metric system should be used on all measurements. Referencing and other matters of bibliographic style should follow the form set forth in the Publication Manual of the American Psychological Association.

Citation of grant or contract support, change in affiliation of one or more authors, and other similar information, should be placed in the Acknowledgement.

Tables. Tables may be used where they will simplify presentation of information. Otherwise they should not be used. Each table should be typed, double spaced, on a separate sheet of paper. The tables should be numbered consecutively with Arabic numerals. The tables should be referred to in the text but the tables should be designed to be self-explanatory. Each table heading should be concise, yet should include a description of what the table contains.

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Introduction

The primary aim of *Directions* is to provide professionals in the field of deafness as much information about the education and welfare of deaf persons as possible. The kinds of information we are trying to provide are extremely diverse. This is so because information needs range across a tremendously wide array of topics, problems, questions, and possible solutions, some of which are long standing and some of which are newly discovered. The recent, current, and projected scholarly/scientific writing and research occurring on the Gallaudet College campus contributes to a certain degree to this need for information. For example, in this issue, information is included on:

"An Analysis of the Etchings of Cadwallader L. Washburn," which was produced by Deborah M. Sonnestrahl;

"A Planning and Assessment Study of an Encyclopedia of the Deaf and Deafness," currently being prepared by John V. Van Cleve; and

"The Validation, Revision, and Dissemination of a Plant Biology Course for the Hearing Impaired High School Student Population," currently in progress by Paul J. Cunningham.

Perhaps, just as important as the uncharted areas of information to which the foregoing contribute are the scientific approaches which are utilized in the production of that knowledge. While science and technology have made basic advances toward meeting some societal needs, Gallaudet College is in a unique position to encourage its faculty, researchers, and staff to contribute to a variety of disciplines and topics related to deafness in a significant way. This is because we firmly believe that advances are needed and can be made in a scholarly fashion, both on a personal/individual basis and on the basis of presenting new information to other professionals and groups. Hence this issue of summaries of research and scholarly writing.

The summaries presented here were submitted by campus personnel, including faculty, researchers, administrators, and staff, in response to a call for a one- or two-page description of recently completed, current, or projected research and writing. For those research activities we knew about but did not get a response, we made a subsequent request with a second note, telephone call, or visit. As a result, we received more than 150 summaries for possible inclusion in *Directions*. The summaries were reviewed and grouped until a set of three general topics gradually became apparent for categorizing them. These three groups were: Social and Cultural Aspects of Deafness; Language and Communication; and Educational Research. Additional items, such as information about books in preparation and a listing of recent proposals and awards, are included in the Addenda section of this issue.

The collecting, editing, and publishing of the summaries contained in this issue is intended to inform ourselves and our readers about scholarly activities on our campus. Because the materials were "volunteered" and we did not wish to belabor the collection process indefinitely, they do not represent an exhaustive set of the activities on the campus. If other writers/researchers wish to contribute additional summaries of their activities, we would welcome them for possible inclusion in future issues. Some consideration is being given to publishing such summaries on an annual basis, which would constitute a more complete presentation of research and scholarly activities.

The reader is encouraged to contact individual authors contributing to this issue in order to track down more specific details or references for the brief information presented here. The contacts with the authors could lead to interesting and valuable sharing, leading to enhanced future studies.

Social and Cultural Aspects of Deafness: Recently Completed Research

The Divided Self in Hawthorne and Dostoevsky

Eugene Bergman
Department of English

A study comparing the works of Hawthorne and Dostoevsky was recently completed which revealed numerous points of contact. Of these points, the strongest and most pervasive is the writers' common interest in the theme of dissociation of the self and the moral ambiguity of evil to which this dissociation is intimately related. Viewed from the perspective of this theme, the parallels and affinities between the two writers become highly significant. In particular, the works of Hawthorne, the more reticent of the two, when illuminated in the light of his Russian fellow novelist, prove to be prophetic and contemporary in their insistence on the reality of evil as a symptom of the sickness of the divided self.

The chapters of the report comparing the works of these two authors concentrate on the following aspects of their literary styles. The first chapter deals with their basic thoughts and psychological insights. Following a survey of the critical tradition that has perceived similarities between the two writers, this chapter centers on their relativistic view of evil. While the authors portray the human condition in terms of "contraries" of good and evil, heart and intellect, reasoning and living, they show that the root of man's misery lies not so much in the existence of these contraries as in his inability to reconcile them. The concern of both writers with the theme of self-dissociation reflects their foreboding of the erosion of individuality implicit in the advent of modern technological civilization.

The second chapter of the report demonstrates that within certain of Hawthorne's tales he created a gallery of "underground men" who were similar in traits and conflicts with characters created by Dostoevsky, who dramatized an envious and bitter rejection of the "real, normal world." Hawthorne describes but does not explain behavior, as if he were a Goya of the pen, providing illustrations to which Dostoevsky supplies the text, as it were, by shedding light on motive.

The third chapter of the report discusses the female protagonists of *The Scarlet Letter* and *Crime and Punishment* as the embodiments of an integral self which is the antipode to that divided self which so engrosses both writers. Both Hawthorne and Dostoevsky identify authentic selfhood with a deep inner vitality and the ability to reach self-actualization which is lacking in the fragmented self with its limited and compartmented responses to others and to life situations.

The final chapter of this study's report explores two other protagonists within *The Scarlet Letter* and *Crime and Punishment*, Dimmesdale and Raskolnikov, respectively, in whom the urge of the divided self to become reunited expresses itself through vile deeds committed in the name of noble ideas. Of these two protagonists, one, Dimmesdale, fails to reach authentic life because the woman he loves is also the focus of his guilt. The other, Raskolnikov, edges closer to real life through a freer relationship with a female. Dimmesdale and Raskolnikov suffer from ideological confusion and spiritual uprootedness and incarnate some of the most salient manifestations of the modern divided consciousness.

The Understanding of Deafness in Media

Laura-Jean Gilbert
Office of Alumni and Public Relations

In the three years since a previous study on the understanding of deafness in media, there have been notable changes in the United States related to deaf and other handicapped persons. Since it is apparent that handicapped persons are getting better coverage in the media, a survey of how well the media understands deafness was conducted a second time using the same survey instruments as the earlier study. The hypothesis was that new media persons had a better understanding of deafness and a more open attitude toward reporting matters related to deafness than at the time of the 1976 study.

The questionnaire was sent to print and electronic media personnel in Los Angeles and Washington, D.C. The results revealed that media persons appear to be more knowledgeable about deaf people than they were in the earlier study. For example, in the present study more respondents indicated an accurate projection regarding the number of hearing impaired persons in the United States, whereas, in the previous study, more than 50% of the respondents responded "don't know" to this question. Other results showed that journalists seemed to be inclined to believe that deafness is no barrier to achievement; over half of the print media journalists in both cities said either that there was

"Over half of the respondents believed that the publications gave a 'balanced and informative picture' of what is happening . . ."

no occupational field a deaf person could not enter, or that they did not know the answer to the question. The percentages of persons responding that they had written a story or done a broadcast about a deaf person or about deafness ranged from a high of 83.3% for TV persons in Washington, to a low of 20.4% for print journalists in Los Angeles. A much higher percentage of persons in all categories said they could recall stories about deafness or deaf persons printed in their publications or broadcast on their stations supporting the original premise of the study that deaf persons are getting better coverage in the media.

In 1976, the survey showed that while coverage of deaf persons and issues related to deafness was much better in Washington than in Los Angeles, media persons in the Los Angeles area felt they were giving fair coverage to the subject (45% print; 55% TV) while persons in Washington were not so sure they were being fair (20.4% print; 40% TV). In the intervening years, while coverage in Washington, D.C. has basically remained constant, coverage in Los Angeles, at least in print, has grown dramatically. Yet, in the recent study, when asked about the fairness of their coverage, the journalists who responded "yes" were 35.8% print and 41.7% TV in Washington, and 26.1% print and 47% TV in Los Angeles.

The results of this study seem to indicate that as their awareness of issues and concerns regarding deafness have grown, journalists become less sure that they are reporting these issues fairly. In encouraging journalists to do stories on successful deaf persons, care must be taken not to give the impression that all deaf persons are successful. Journalists must be warned not to portray handicapped persons as if they have no problems at all. While journalists are today more open to reporting stories about all handicapped individuals, they still need assistance in understanding all aspects of what it means to be a handicapped person in our society.

Readership Survey and Analysis: Gallaudet Today, Gallaudet Alumni Newsletter, and the College's Annual Report

Laura-Jean Gilbert
Jack Gannon
Office of Alumni and Public Relations

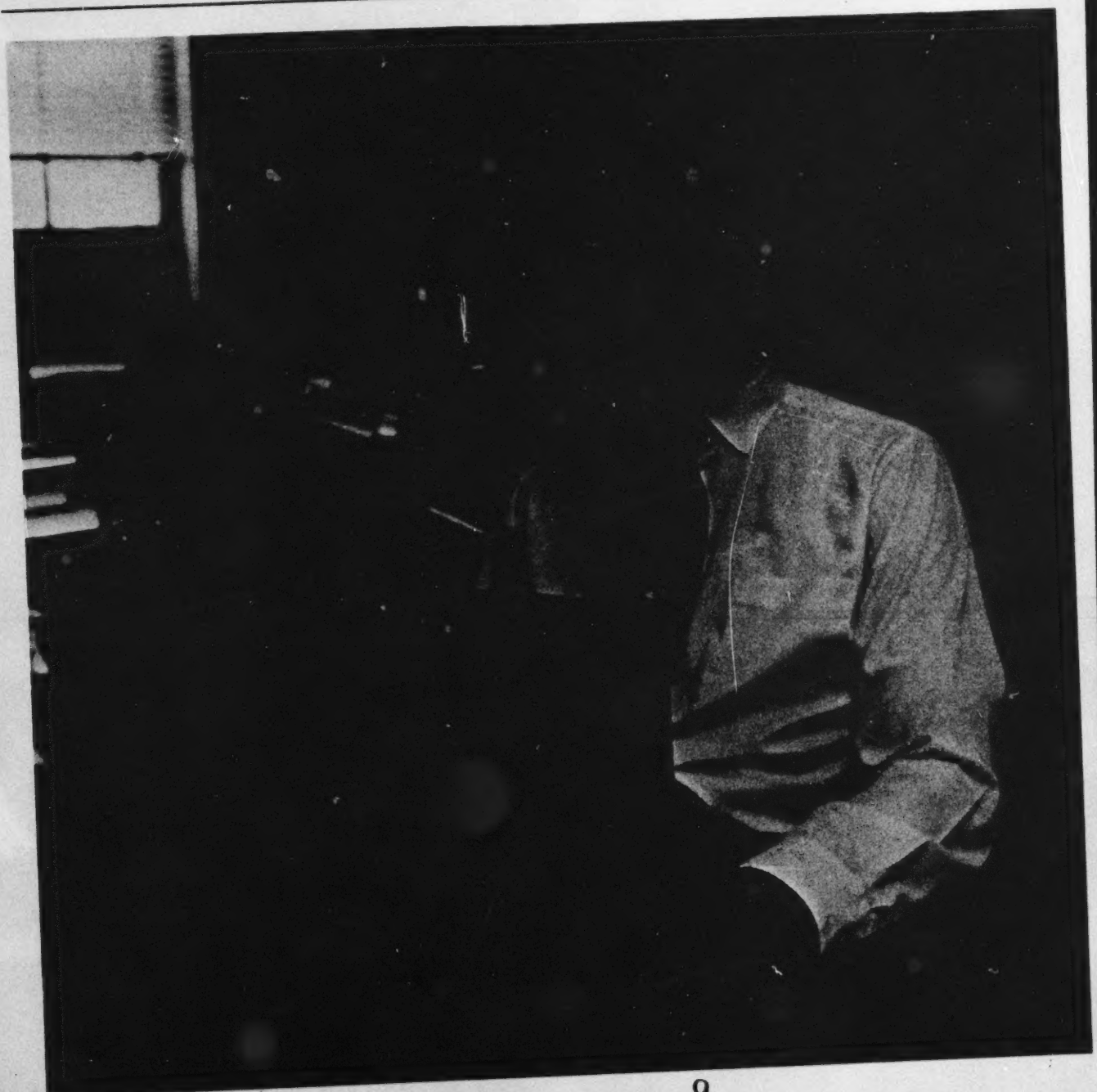
A survey was conducted in order to gather data on the effectiveness of the major publications produced by the Office of Alumni and Public Relations which would assist in future planning for these publications. The survey was designed to determine the following:

1. If alumni and other readers were aware of and satisfied with the *Gallaudet Alumni Newsletter*, *Gallaudet Today*, and the College's *Annual Report;*
2. How readers rated the various sections within these publications;
3. Whether alumni were satisfied with the format of these publications;
4. Whether readers were receiving the *Gallaudet Alumni Newsletter* on time;
5. What kind of articles and issues were most popular with the readers of *Gallaudet Today;*
6. Whether readers were receiving multiple copies of these publications;
7. Whether readers felt that these publications gave an accurate picture of Gallaudet College; and
8. Whether readers felt the College was providing them with enough, not enough, or too much information.

The questionnaire was sent to 500 persons selected at random from the computerized list of 5,000 names which make up the mailing list for the *Gallaudet Alumni Newsletter.* The following results are based on the 267 responses which had been received by mid-June, 1979.

Of those persons responding to the survey, 98.1% receive the *Gallaudet Alumni Newsletter*, more than 80% receive *Gallaudet Today*, but only 45.2% of the alumni and 15.4% of nonalumni responding receive the College *Annual Report.* Further, only 12% of the persons responding reported receiving any other publication from Gallaudet College on a regular basis. The majority of persons reported that they read all or most of both *Gallaudet Today* and the *Gallaudet Newsletter.* Highest readership was indicated for the *Gallaudet Newsletter* (94.7%); lowest readership was for the *Annual Report.* Over half of the respondents believed that the publications gave a "balanced and informative picture of what is happening on Kendall Green"; 26.9% of those responding felt that the publications presented a "very positive picture of the college."

The *Gallaudet Alumni Newsletter* was rated either "good" or "very good" by 95% of the polled readership. Least popular was the Job Listing column. The major criticism of the publication was related to its delivery. Most readers indicated a



"It was projected that the more facile the communication between the students and their parents . . . the more the students would conceive their parents as being influential . . ."

willingness to pay for the *Newsletter*, if it were truly necessary. There was split opinion as to whether the *Newsletter* should be published monthly or semimonthly.

Gallaudet Today was rated either "good" or "very good" by 94% of the polled alumni and 80% of the polled nonalumni. Readers reported that they preferred issues with a variety of articles over "theme" issues; about 40% liked having a combination of theme and miscellaneous issues. Of the regular sections appearing in *Gallaudet Today*, the Campus News section (On the Green) was ranked highest and the Book Review section was ranked lowest. Articles from back issues related to Kendall Green received the highest ranking, but, paradoxically, asked what sort of articles they would like to see in future issues, persons answered most often, "Articles on issues of concern to deaf persons." Approximately 19% of alumni and 16% of nonalumni indicated that they receive multiple copies of some publications.

The results of the survey showed that the readers are generally satisfied with *Gallaudet Today* and the *Gallaudet Alumni Newsletter*, but that the College's *Annual Report* needs to establish a clearer identity. Some decisions have been made based on the survey results. Because the *Newsletter* is so popularly received, its format will be maintained; however, consideration should be given to returning to a monthly publication schedule. A promotion campaign directed toward nonalumni should be conducted for *Gallaudet Today*.

The Relationship between Deaf Students and their Parents in the Development of Occupational Goals

Richard Meisegeier
Department of Sociology

This study was designed to determine the extent to which deaf college students perceived their parents as sources of influence for their occupational aspirations. Using the theoretical model of reference groups, the study attempted to show that the two determinants for perceiving parents as sources of influence were (a) the ability of the student to communicate with his parents, and (b) the degree to which the student perceived himself to be similar to his parents. It was projected that the more facile the communication between the students and their parents, and the more similarities the students perceived between themselves and their parents, the more the students would conceive their parents as being influential in the development of their occupational goals. The following variables were controlled within the study: (a) hearing status of the parents, (b) mode of communication used between parents and student, and (c) the residential status of the student.

The responses from 370 deaf college students were included in the data analysis. Multiple regression analysis by sex revealed, as predicted, both males and females perceived both their fathers and their mothers as being influential in the development of their occupational goals if they could communicate with their parents or if they perceived themselves as being similar to their parents, regardless of the control variables.

The major findings when the data were analyzed by means of contingency tables and Chi-square may be summarized as follows:

1. Communication was found to be a determinant for perceiving father as being influential for males when the father was hearing, when the "oral" mode of communication was used, or when the son had been *either* a residential *or* a nonresidential student.

2. Communication was found to be a determinant for perceiving mother as being influential for males when the mother was hearing, when the "oral" mode of communication was used, or when the son had been a nonresidential student.

3. Communication was found to be a determinant for perceiving father as being influential for females when the father was hearing, when *either* the "oral" *or* the "manual" mode of communication was used, or when the daughter had been *either* a residential *or* a nonresidential student.

4. Communication was not found to be a determinant for perceiving mother as being influential for females.

5. Perception of oneself as being similar to father was found to be a determinant for perceiving father as being influential for males when the father was hearing, when *either* the "oral" *or* the "manual" mode of communication was used, or when the son had been *either* a residential *or* nonresidential student.

6. Perception of oneself as being similar to mother was found to be a determinant for perceiving mother as being influential for males when the mother was *either* hearing *or* deaf,

when *either* the "oral" *or* the "manual" mode of communication was used, or when the son had been *either* a residential *or* a nonresidential student.

7. Perception of oneself as being similar to father was found to be a determinant for perceiving father as being influential for females when the father was hearing, when *either* the "oral" *or* the "manual" mode of communication was used, or when the daughter had been *either* a residential *or* a nonresidential student.

8. Perception of oneself as being similar to mother was found to be a determinant for perceiving mother as being influential for females when mother was hearing, when the "manual" mode was used, or when the daughter had been a residential student.

An Analysis of the Etchings of Cadwallader L. Washburn

Deborah M. Sonnenstrahl
Department of Art

A study was made of Cadwallader L. Washburn's life and etchings in an attempt to justify his reputation. Washburn, an early twentieth century deaf American etcher-painter (1866-1966), left behind a lengthy handwritten diary containing his personal opinions and numerous works which include mostly etchings and dry points. Washburn's diary and works provided the basis for this study, which resulted in a paper commemorating the first anniversary of his death. The study includes (a) a brief explanation of graphic arts, (b) a biography of Cadwallader Washburn, (c) an analysis of Washburn's artistic style, (d) a comparison of the relationship between Washburn and Goya, (e) Washburn's personal opinions of art, and (f) a documentation of exhibitions and museums displaying Washburn's works.

At present, Cadwallader Washburn has not received appropriate notice within American art. However, his name has appeared in various new art books recently. Studies, such as the present one, contribute to drawing notice to Washburn's talent by assembling little-known facts concerning this foremost deaf artist.

Social and Cultural Aspects of Deafness: Current Research

Criminal Victimization of the Deaf

Virginia G. Cowgell
Psychology Department

During the 1970's, the problems faced by crime victims have been increasingly recognized. A crime, and any ensuing legal action, may have repercussions for the victim in areas as varied as emotional functioning, family life, occupational and financial situation, and health. While many areas of the country are beginning to develop programs to assist victims in various ways and to educate the public about crime prevention, little of this work has acknowledged the problems of handicapped individuals who might become victims of crime. The problems of deaf victims have especially been ignored. Many law-enforcement agencies say that they have never seen a deaf crime victim. Courts often have no procedures to assure that the hearing impaired victim has access to crucial information about the case, or even to assure competent interpreting services. Similar problems may arise for the deaf victim who seeks medical treatment after an assaultive crime.

A research project is being done which will result in the collection of some basic information which can help agencies and organizations develop programs for hearing impaired persons, both as victims and in crime prevention. Answers to the following questions are being sought:

1. What is the rate of criminal victimization of various types within various hearing impaired populations?
2. What is the perceived accessibility and use of various services by deaf and hard of hearing victims?
3. What are the immediate and long-term consequences of the crime upon the victim's social and emotional well-being (in terms of emotional state, family life, health, occupation, living arrangements, etc.) as reported by the victim?
4. What are the major concerns and fears of hearing impaired people regarding crime? and
5. What strategies are used in these groups for avoiding crime or for self-protection?

The research will be conducted in three stages. First, agencies working with hearing impaired persons, victim services, and members of the deaf community will be contacted to determine current procedures and services and their perceptions about the needs of deaf victims.

Second, a questionnaire soliciting information on the occurrence of crimes, attitudes toward the probability of victimization, crime-avoidance behaviors, and perceptions of times will be distributed to various deaf and hearing impaired populations (college age and adults).

Finally, a sample of deaf and hearing impaired crime victims, as identified by questionnaire responses or by service agencies, will be requested to participate in personal interviews. Those persons who agree will be interviewed regarding the nature and circumstances of the victimization, the victim's experience with law enforcement, the courts and other agencies, and the victim's process of recovery after the crime. Interviews will be conducted by a person who is fluent in varieties of manual communication, under the supervision of a clinical psychologist.

The final report of the project will summarize the incidence of victimization reported, along with attitudes and behaviors regarding the possibility of victimization.

The Development of an Inventory for Assessment of Social and Emotional Behaviors in Deaf Children

Kathryn P. Meadow
Educational Research Laboratory
Division of Research

A research study has been conducted which is resulting in the design of an assessment instrument which will be useful to classroom teachers and to researchers in evaluating behaviors of deaf children as compared to norms based on a large number of students from varying educational settings.

Hearing impaired students (N= 2,359) from 10 different schools and programs in the United States were rated by their teachers. A set of 69 items describing behaviors were developed, drawing heavily on the suggestions of teachers at the Kendall Demonstration Elementary School. The set of items was used on a trial basis with the Kendall population, revised, and submitted to more than 50 professionals experienced in work with deaf students in fields of education and mental health. On the basis of their suggestions, the items were revised again. The final set of revised items were then distributed to teachers in a variety of schools and programs for hearing impaired students.

The resulting data were subjected to item analysis and to factor analysis. Ten items were eliminated. The remaining 59 items were combined into three factors identified as "so-

cial adjustment," "emotional adjustment," and "self-image." A manual will be prepared as a guide for scoring and interpreting the inventory.

The Measurement of Attitudes Toward Deafness: A Test Manual

John G. Schroedel
Educational Research Laboratory
Division of Research

A study is being done with the objective of preparing a manual containing an evaluation of existing instruments used to assess attitudes toward deafness and related attributes. More than 100 scales have been developed during the last 50 years to measure attitudes toward deafness and its related manifestations. Selected scales, especially those more commonly used, will be evaluated following a standard format. Each evaluation will include information about the background of the test, indicators of reliability and validity, norms for general and deaf populations, testing instructions, scoring keys, and guidelines for selecting suitable subjects as well as interpreting test results.

The completed manual will contain in one reference source, key information, much of it previously unpublished, that researchers frequently use in screening attitude scales. It is envisioned that the manual will be published in a research handbook on the social psychology of deafness along with a compendium of abstracts which is also presently being prepared.

Attitudes Towards Deafness: A Compendium of Research Abstracts

John G. Schroedel
Educational Research Laboratory
Division of Research

The objective of this research is to prepare for publication a collection of 500-word summaries of significant research on the social psychology of deafness. These summaries, following a standard format, will highlight the purpose, significance, methods, and results of each study. They will be combined into a compendium which also includes a key-word index and other references to enhance its usefulness. This publication will contain sufficient information so that readers can easily screen the research literature in order to make decisions as to the acquisition of primary documents. Literature to be summarized will be selected from among 250 studies since the 1930's on attitudes towards deafness and its related attributes: deaf people, communication modalities, and organizations and schools in the deaf community. These studies have been done on deaf children and deaf adults, their parents, siblings, as well as teachers, counselors, and other professionals serving them.

The completed compendium will serve as a ready-reference research tool for college students and researchers. It is projected that it may be published in a research handbook dealing with the social psychology of deafness along with an attitudes test manual which is also being prepared at the present time.

The Deaf Worker in the Labor Market: An Attitudinal Research Model

John G. Schroedel
Educational Research Laboratory
Division of Research

Participation in the labor force by deaf persons can often be characterized by problems of unemployment, under-employment, and occupational immobility. Strategies such as career education, vocational rehabilitation, postsecondary education, and affirmative action are being directed to overcome the employment problems of deaf persons.

The objective of a study presently being conducted is to prepare a monograph with a research-generating model which clarifies the roles of deaf workers' and their employers' attitudes in the labor market. The intent of the monograph is toward answering this question: How do attitudes of deaf workers, attitudes of employers, and/or a combination of these influence labor market participation and occupational attainment? It is projected that better identification and specification of these attitudes can provide insights which will make employment-enhancement strategies more effective for deaf Americans. The monograph will include a research model diagramming variables and relationships between them, relevant to attitudinal influences upon labor force participation and occupational attainment by deaf workers. The completed model may set some directions for future research.

" . . . a study to determine the number of hearing impaired patients in state and county mental hospitals . . . "

Parental Perceptions of their Influence on the Career Goals of their Hearing Impaired Adolescents

Richard C. Steffan, Jr.
Model Secondary School for the Deaf

The study proposes to determine parental perceptions of their influence on the career goals of their hearing impaired adolescents (age 13-19).

Hearing parents (N = 47 families, 65 subjects) who had deaf adolescents enrolled at the Model Secondary School for the Deaf during 1978-79 participated in the study. An initial attempt was made to include parents from several other schools for the deaf. However, due to a number of reasons, participation was declined. It was also intended that both hearing and deaf parents be included in the sample. After repeated efforts to contact deaf parents, the investigator determined that the sample population would include black and white hearing parents only.

Data for the study were obtained by means of a semistructured interview. Three female interviewers (one white and hearing, one black and hearing, one white and hearing impaired) were trained to administer the interview questionnaire. A pilot-test of the questionnaire resulted in a modified test instrument which was administered during the summer of 1979.

Data are presently being analyzed. Preliminary results show that parents do perceive that they influence the career goals of their hearing impaired adolescents. Race and educational background do seem to be important variables in the influences parents exert.

National Study of Hearing Impairments Among State and County Mental Hospital Patients

Raymond J. Trybus
Terry Edelstein
Division of Research

The Senate Appropriations Committee indicated in the FY 1978 appropriation for the National Institute of Mental Health (NIMH) that its Director should undertake a study to determine the number of hearing impaired patients in state and county mental hospitals throughout the United States. NIMH should also collect information about their characteristics and about the services they are receiving in comparison with mental hospital patients, in general. Finally, NIMH was directed to produce a state of the art document on the provision of mental health services to hearing impaired persons.

In March 1978 NIMH contracted with Gallaudet College to conduct a project to respond to the Senate's directive. The College hired a full-time Research Coordinator and convened an ad hoc national advisory group to review the plans for the study and to comment on the procedures and data collection forms. Simultaneously, a substantial review of the literature on provision of mental health services to deaf people was undertaken.

The design of the project is in several phases. In the first phase, all state and county mental hospitals in the United States, approximately 280 units, were contacted and asked to complete a variety of data collection forms. First, a Hospital Administrators Survey requested information about the availability of programs for deaf persons, special equipment for hearing impaired people, and hearing impaired employees on the hospital staff. A second part of this initial phase included a listing and description of all wards within the hospital.

The final and most important part of Phase 1 involved an individual patient form which was to be filled out by the ward supervisor for every known, or suspected, hearing impaired patient in the ward. The procedure was designed primarily to determine the number of hearing impaired patients, their characteristics, and a brief description of the services that hearing impaired patients are receiving.

Phase 2 of the project involved the selection of a national stratified random sample of patients in psychiatric hospitals, in general, throughout the United States. The same individual patient form was used to collect information on this general sample. This procedure had two purposes. By chance, a small proportion of the patients in this sample (N = approximately 3,000) will be hearing impaired persons, and a check-back will be made to see whether such patients had been reported in Phase 1. To the extent that they have not been reported, this permits the development of an estimate of the undercounting occurring in Phase 1. The second purpose of Phase 2 is to provide data about the patient characteristics and the services received for the hospital population in general with which to compare the data on hearing impaired patients obtained in Phase 1.

Phase 3 also contains two parts. Because of concerns about the accuracy of the reports, a subsample of the Phase 1 and Phase 2 samples will

be visited in person by a member of the project team for the purpose of verifying the hearing status of the individual. The second portion of Phase 3 is the conducting of visits to existing mental health programs for deaf people, both in hospitals and in other settings, to determine the nature and size of the program, their methods of operation, their funding patterns, and the like, in order to put together the state of the art report required by NIMH in the original project design.

Social and Cultural Aspects of Deafness: Projected Research

The Relationship of Locus of Control of Parents of 0-3 Year Old Hearing Impaired Children to the Quality of the Home Environment

Barbara Bodner-Johnson
Department of Education

If children are exposed to certain caregiving practices and environmental conditions, they are more likely to develop the behaviors which have been shown to predict success. The relationship between a higher socioeconomic status and a more favorable home environment has been established. Very little is known, however, about the relationship of parental psychosocial characteristics and the quality of the home environment they provide. Psychosocial characteristics of parents which are postulated to influence the child's environment include, first of all, overall parental competence, and more specifically, the following: (a) perceptions of responsibility and control; (b) confidence in judgment abilities; and (c) successful achievement behavior. It would also be expected that knowledge about what is important and a willingness to gain information leading to success would influence the home environment provided by the parents.

The locus of control construct is an integral part of social learning theory. An individual with internal locus of control assumes responsibility for the outcomes of his actions and believes that to a great extent he can, through ability and effort, control what happens. Behavior correlated with internal locus of control is: (a) greater cognitive activity, (b) confidence in judgment abilities, (c) successful academic achievement, (d) self-imposed delay of gratification, and (e) accepting personal responsibility for success and failure. On the other hand, an externally oriented person attributes the outcomes of his behavior to external forces such as task difficulty and chance, and believes he has little control over his life. Further, he appears more impulsive, lacks self-confidence, and "gives up" when facing failure. Thus, the parent whose hearing impaired child is "failing" to develop certain communication skills can locate control internally, saying that he or she (the parent) must seek alternative methodologies for the child to develop communication, or externally, saying that the skills are too difficult for the child.

The overall prediction in this study is that parents who are found to be more internally oriented will provide a more favorable home environment for their young deaf child than parents whose locus of control is externally oriented.

Parents from the metropolitan Washington, D.C. area will participate in the study. They will comprise two groups: parents of 0-3-year-old hearing children and parents of 0-3-year-old deaf children. Data will be collected using the HOME inventory, which is a 45-item standardized research scale used to measure early environmental stimulation provided in the home. The HOME measures such factors as the emotional and verbal responsivity of the mother in her interactions with the child, the type of play materials, the types of activities the child is allowed or encouraged to engage in, and the organization of the environment. The administration of the HOME requires a home visit of about an hour's duration. This will allow for observation of the child in his natural habitat in interaction with his principal caregiver. During this time also, relevant interview procedures will be completed for obtaining HOME data. Data will be collected over a period of five years, allowing for the accumulation of a large data base.

The development of the home environment is a major objective for educators working with parents of young deaf children. Acknowledging that the parents are the child's first and primary teachers, efforts are geared toward observing the everyday conditions surrounding the child and making recommendations based on what we know to be favorable learning conditions. Knowledge in the area of the social-psychological characteristics of parents relative to the environments they provide would add to our counseling and observation/evaluation methodologies.

The Gallaudet/Oberlin College Student Exchange Program

Shirley P. Stein
Department of Communication Arts

Gallaudet College has developed a contractual arrangement for an exchange of students with Oberlin College in Oberlin, Ohio, and with Western Maryland College, in Westminster, Maryland. The program is open to junior and senior students who meet certain criteria. In addition, Special and Exchange hearing students are invited from any college in the United States to spend one or two semesters attending classes at Gallaudet College. Approximately 15 hearing students take advantage of this program each semester.

Questions have arisen regarding

the impact and long term value of the mutual experiences of the exchange programs. More definitive information is needed about attitudes, attitudinal changes, professional focus, and other concerns that have been the result of the hearing student's Gallaudet experience and the Gallaudet student's reactions to their experience on other campuses.

An investigation is planned related to the following:

1. The Gallaudet Undergraduate Student Exchange Program with Oberlin College and with Western College;
2. The Special Student Program for undergraduates on the Gallaudet College campus;
3. The three Winter Term courses which have been taught at Oberlin College on the topics of Orientation to Deafness and Manual Communication; and
4. The contacts between Gallaudet students with exchange and special students on the Gallaudet College campus.

Language and Communication: Recently Completed Research

A Criterion Referenced Test of Written Language Syntax for Hearing Impaired Students

Sharon Berry
Virginia School for the Deaf

The purpose of the study was to develop a screening assessment instrument for the written language syntax of hearing impaired students. The criteria established for the assessment instrument included the following: (a) the test must be simple to administer and score, (b) the test must adequately reflect language performance on a variety of language skills, (c) the test results must be based on contemporary linguistic research findings, and (d) the test must be well designed and have appropriate psychometric properties.

The need for this type of assessment instrument was demonstrated in a survey of literature and related research which revealed that in no areas except articulation tests were instruments available to assess what a student could do and could not do in a way that could be directly related to an instructional program. The publication of the Test of Syntactic Abilities in 1978 partly filled the void that exists in the availability of assessment instruments for hearing impaired students. That test and the instrument developed in the present study are similar in that they are innovative approaches to language assessment based on contemporary linguistic models. They differ significantly in their design and intended usage. Therefore, the development of a valid assessment instrument could have great significance if it benefitted teachers and clinicians in determining present levels of language syntax performance and in establishing appropriate instructional goals for hearing impaired students.

This instrument, the Language Syntax Test, was based on a sequence of 69 objectives related to written language syntax. These objectives evolved from many years of language teaching experience. Items associated with the objectives were assembled into a classroom test and administered over a three-year period in a day class program for hearing impaired students. On the basis of teacher recommendations and high positive correlations obtained with other measures of language performance during these pilot studies, it was determined that a more extensive study of the instrument was merited.

The following five specific research questions were investigated:

1. Does the Language Syntax Test have content validity?
2. Is the Language Syntax Test reliable?
3. Does the Language Syntax Test have criterion related validity?
4. Are factors of sex, degree of hearing loss, type of educational program, mode of communication, age, and the number of years in school related to students' performance on the Language Syntax Test?
5. What is the relationship between the controlled and uncontrolled elicited language samples obtained on the Language Syntax Test?

The first question was answered satisfactorily during the development of the research version of the Language Syntax Test. Two substudies compared the objectives and items of the test to objectives contained in contemporary curriculum studies, and to responses from professionals judging the content, sequence, and scope of the Language Syntax Test. The latter four questions were answered by results obtained in the data gathering and analysis study.

Adaptive Speech Testing Applied to Hearing Impaired Listeners

Daniel L. Bode
Department of Audiology

Adaptive testing of speech discrimination requires that test words be systematically varied in intensity during the test. These intensity changes are controlled by the tester and are based on a listener's performance (correct/incorrect) on a predetermined set of words. Each set may have only a single word or it may have a larger number, depending on the target percentage score of interest.

The person using an adaptive test administers it in such a way that a "bracketing" of the desired response level is achieved. Previous studies have suggested applications for measuring maximum speech discrimination levels, "roll-over" of discrimination functions, relative audio-visual contributions to speech perception in noise, word-initial and word-final consonant discrimination, and predictive relationships between perception of monosyllables and spondee words.

The purpose of the present experiment was to determine the stability and accuracy of adaptive tests with hearing impaired listeners. Subjects were 10 adults with sensorineural

hearing impairment. The audiometric thresholds in the test ear indicated a mild-moderate impairment, with hearing sensitivity better in the low frequencies than for higher frequencies. The mean age was 45 years (range: 18-67), and the mean SRT in the test ear was 35 dB HTL (55 dB SPL).

The adaptive strategies used were the Doublet (two-word) procedures. With these strategies, no more than two words were presented at any single testing level. For the target score of 70%, when any two adjacent words were correctly identified, the level for the subsequent pair was *decreased* by two dB; when either the first word or the second word of a two-word ensemble was missed, intensity was *increased* by two dB. This procedure was followed until all 50 words had been presented. The mean of the mid-points of the up-down intensity changes was taken as the Doublet estimate of the intensity required for 70% discrimination. For the 30% estimation, the strategies for intensity changes were the opposite of those for 70%.

Results in quiet for the impaired listeners showed 67 and 68 dB SPL mean estimates of the 70% target for the test and retest conditions, respectively. Criterion constant-level tests revealed mean discrimination scores of 66% and 70% for the respective conditions. For the 30% target, mean levels were 55 and 54 dB SPL for the test and retest conditions, with obtained mean criterion scores of 30% and 28%, respectively. Test /retest level differences during quiet were ± 1 dB.

Results in the noise condition showed +4 means S/N ratio estimates of the 70% target for both tests. Constant-level tests revealed mean discrimination scores of 67% for both conditions. For the 30% target, mean S/N ratios of −4 and −5 were obtained for the two test conditions. Mean discrimination scores of 36% and 30% were measured during the test and retest conditions, respectively. Test/retest differences in S/N ratios were 1 dB or less.

Basic Considerations in Standard Error Calculations for Speech Discrimination Tests

Daniel L. Bode
Department of Audiology

In addition to stable, accurate, and efficient results, there is another potentially valuable feature of adaptive testing of speech discrimination. Information is available during adaptive tests that cannot be achieved by any reasonable protocol with conventional testing. Specifically, a standard error of the midpoint estimates obtained during testing can be calculated for an individual, using only a single test administration. These calculations might allow the examiner to reach conclusions, for any given mean measure, regarding the probable limits of the corresponding "true" score. In other words, a confidence interval could be estimated.

With adaptive testing for individuals we used an up-down "bracketing" of the target level (30% or 70% discrimination). The average of the midpoints of the alterations in level is taken as the best estimate of performance. What is done then is to calculate a standard deviation of the variation of these midpoints around the mean level. With this standard deviation in hand, the test's standard error is calculated by dividing the standard deviation by the square root of the number of midpoints minus 1. Then the standard error can be translated into a confidence-interval for whatever level of confidence the tester wishes, e.g., 0.95, 0.99. These calculations, in turn, would allow the tester to reach statistical conclusions for the obtained measure regarding the probable limits of a corresponding true score.

Since any two adjacent midpoints are not statistically independent, we used only every other midpoint (ascending or descending) for our present calculations. To illustrate the operations involved, the results obtained by one normal-hearing listener during a single test condition (the 30% test during the first test session) are shown in Table 1. In the example shown in Table 1, the ascending, descending, and thus the total estimates of the 30% S/N ratio are identical at −6.9 dB. In rows 2 and 3 are the calculated standard deviations of the midpoints and the associated standard errors.

The standard error found in the ascending runs, 0.12 dB, was used for the next set of calculations which are shown in Table 2. In the first row is the standard error of 0.12 dB obtained with 8 midpoints. The second row shows the basic definition of a confidence-interval: the mean plus or minus the product of the tabled critical t-value (with appropriate degrees of freedom) and the standard error. For this listener (row three), we have a mean level of −6.9 dB plus or minus a critical-t of 2.3 times the standard error of 0.12 dB. Completing these calculations, shown in rows four and five, we found a confidence-interval of −6.6 to −7.2 dB. Consequently, we are 95% confident that the true

Table 1
Mean Signal-to-Noise Ratios (S/N), Standard Deviations, and Standard Errors for Ascending and Descending Adaptive Tests for a Single Listener (SS)

Subject: SS — Target Score: 30%

Variable	Ascending	Descending	Total
Mean S/N	−6.9 dB	−6.9	−6.9
Standard deviation	0.35 dB	0.38	–
Standard error	0.12 dB	0.14	–

Table 2
Example of Steps and Calculations Associated With Use of a Standard Error to Determine a Confidence Interval for a Single Listener (SS)

Subject: SS — Target Score: 30%

(1)	Ascending standard error (SE)	= 0.12 dB (n = 8)
(2)	Confidence interval in dB (0.95)	= Mean ± t (df/0.05) × (SE)
(3)		= −6.9 ± (2.3) × (0.12)
(4)		= −6.9 ± (0.3)
(5)		= −6.6 to −7.2 dB

mean level for 30% discrimination falls within this range. If we tested this listener with the test words presented at −6.9 dB a large number of times, then (all things being equal) we would expect 95% of scores to fall within this range. Any obtained score outside this range would indicate either a probable occurrence due to chance or some significant change in the listener's performance.

The confidence-interval in dB also can be transformed to another confidence-interval in percentages by multiplying the dB interval by the estimated percentage change in discrimination score per dB change in signal level. This estimated change is about 5-6% per dB for normal listeners with the NU-6 recordings used in these studies.

It is highly desirable to know the error of measurement associated with a given test score. This information cannot be easily obtained with constant-intensity tests without giving the tests several times. Approximations based on responses from previous listeners can be helpful, but this procedure has not yet been demonstrated to be a completely reasonable solution. Further, error calculations imply that standardized test conditions exist which, in most applied situations, is not the case. Estimates of standard error, similar to those described here, may provide an answer to this problem since these error calculations can be obtained from the responses of individual listeners during a single test administration.

Impaired Versus Normal Performance

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A comparison was made of impaired and normal listener speech discrimination performance during adaptive tests in quiet and in noise. Twenty-four normal and 10 hearing impaired listeners were tested under identical listening conditions. Impaired listeners (mild-moderate hearing loss) demonstrated +1 and −1 dB effects for the 70% and 30% target conditions, while normal listeners showed 0 and −1 dB effects. During testing in noise, test/retest effects in signal to noise (S/N) ratios were 0 and −1 dB for the impaired listeners and +1 and −2 dB for the normal listeners.

Discrepancies between the predicted and obtained discrimination scores also were relatively small and similar for the impaired and normal listeners. For testing in quiet, the impaired listeners showed *actual* discrimination scores that were 3% less than the *predicted* 70% score, while actual scores showed 0% difference when compared to the predicted

"There are many circumstances where one would like to have (a) a reliable and quantifiable criterion measure of speech discrimination . . . "

30% performance. For the normal listeners, actual scores were 5% less than predicted for the 70% condition, while the discrepancy was 0% for the 30% condition.

For testing in noise, discrepancies for the impaired listeners were −4% for the 70% condition and +4% for the 30% condition. Discrepancies for the normal listeners were +1% and +4% for the respective target scores.

It was also of interest to compare the dB differences *between* impaired and normal listeners on the adaptive tests in quiet and in noise. The impaired listeners required 35-40 dB greater intensity in quiet than normal listeners for equivalent performance levels, i.e., 70% and 30% speech discrimination. This difference in levels corresponds neatly with the Speech Reception Threshold of 35 dB HTL obtained by the impaired listeners. That is, they differed from audiometric zero (i.e., "normal" reference) by 35 dB, a value identical to the 35 dB difference between groups for the 30% condition.

The difference between impaired and normal listeners in noise, however, was much smaller. Here the difference between groups was only 2 dB. This result illustrates the effectiveness of the noise in "equalizing" performance of the two groups. It also suggests the need for very precise measures of speech discrimination in noise if one wishes to reveal differences between impaired and normal listeners of the kind participating in this experiment. As indicated by both the stability and the accuracy of present results, adaptive testing may be a means to achieve this precision.

Adaptive testing is a procedure for rapidly and efficiently determining preselected points on performance-intensity functions. These results apparently can be obtained for hearing impaired and normal listeners, both in quiet and in white noise backgrounds.

Standard Error Calculations for Speech Discrimination

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Department of Audiology

The present standard error calculations were obtained via adaptive test procedures. The purpose of the analyses presented here was to examine the precision of adaptive measures, that is, confidence-intervals for tests with hearing impaired listeners.

There are many circumstances where one would like to have (a) a reliable and quantifiable criterion measure of speech discrimination, (b) a rapid estimate of the standard error associated with this measure, and (c) an estimate which could be calculated for an *individual listener during a single test administration.* These calculations would allow the examiner to reach conclusions, for any given measure, regarding the probable limits of corresponding true scores. In other words, a confidence-interval could be estimated.

The basic concepts and procedures involved include (a) calculating the standard deviation of the midpoints, (b) dividing the standard deviation by the square root of n-1 to obtain a standard error score, and (c) using the standard error to estimate a confidence-interval. All of these measures for an individual listener are obtained from a single test with 50 words; thus, actual testing time is identical to that required by a conventional speech discrimination test.

The mean standard errors obtained in this study, based on calculations for *individual* impaired listeners in response to adaptive testing in *quiet*, ranged from 0.5 to 0.8 dB. Similarly, during testing in noise, standard error scores ranged from 0.5 to 0.7 dB.

Given a standard error of 0.5 dB, for example, the confidence-interval is defined as the mean measured level plus or minus a "critical-t" value for the 0.05 level of confidence, times the standard error. Given a tabled critical-t value of 2.2 for 12 degrees of freedom (the number of midpoints minus 1) results in a confidence-interval of ± 1.1 dB.

The practical interpretation of this result is that there is 95% confidence that the person's *true* mean adaptive level falls within this range. That is, if the person could be retested an infinite number of times, then the obtained levels 95% of the time should be within a range of ± 1.1 dB. Any score outside this range would indicate a significant change in the listener's auditory speech perception, or a significant change in the listening condition, or some combination thereof.

The confidence-interval in dB to one percentage speech discrimination can also be changed. Given the confidence-interval of 1.1 dB, this value is multiplied by the slope of the performance-intensity function. The slope in noise for the present impaired listeners was 4.6% per dB. This means that for every 1 dB change in level of the test lists there was about a 5% change in speech discrimination performance. Completing the calculation, a 95% confidence-interval in percent of ± 5.1% is found.

The practical interpretation here

is that if this listener was tested with the test words presented at the level obtained by the adaptive test an infinite number of times, then (all things being equal) 95% of these scores would be expected to be within a range of about ± 5%. Further, any score falling outside this range would indicate a significant change in performance beyond the 0.05 level of confidence.

Given the range of average standard errors obtained (0.5 to 0.8 dB), the range of associated confidence-intervals was ± 1.1 dB to ± 1.7 dB. The range of confidence-intervals *in percent* for the noise condition was ± 5.1% to ±7.8% and for the quiet test condition ± 3.4% to ± 5.2%.

An individual's test results could be compared to similar test results for other conditions of interest to answer the following kinds of questions:

1. Hearing aid A differs significantly from hearing aid B, or does not differ, in improving this person's speech perception performance;
2. The individual's speech perception has increased or decreased significantly, or has not changed, from the last test occasion to the present one;
3. Auditory training has significantly improved the person's speech perception or has not significantly affected performance;
4. Adding visual cues (speechreading) to auditory cues significantly improves overall speech perception performance or it does not improve this receptive behavior

Clinical studies are needed to evaluate these applications. Attention also should be directed toward possibly improving even further the stability, accuracy, and precision of adaptive tests. Reducing step-size from 2 to 1 dB and using a closed-set response format might accomplish these objectives.

Signed English: A First Evaluation

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The Signed English system is an educational tool primarily intended to facilitate the English language development of hearing impaired children. Its present use is largely based upon intuitive appeal and common sense observations "that it works." It was deemed necessary to determine objectively the effectiveness of the system at the earliest opportunity, i.e., even during the very course of its development, so that educators of hearing impaired students would know what to expect of the system and so that the system designers would know how to improve it. A research study was conducted in order to answer the following questions:

1. What is the rate of vocabulary acquisition?
2. What is the course of syntax development?
3. What level of skill in Signed English do the parents achieve?
4. Do children continue to voice or speak after continued use, and what is the quality of that speech?
5. How well do children comprehend or receive words expressed with voice alone or with voice and signs simultaneously?
6. What is the course of development in the production and reception of the Signed English markers?

An unselected group of 20 children with a mean better ear loss of about 90 dB enrolled in a residential school, a day school, and three day classes in the state of Maryland were the principal children studied. In one cross-sectional comparison, a second group of 17, and a third group of 11 comparable children enrolled for shorter periods were tested. This was a four-year longitudinal study of children who began preschool at approximately age four. The children were individually tested annually with the Peabody Vocabulary Test, the Northwestern Syntax Screening Test, and a tailor-made English morphology test. Ratings of parent skill in Signed English were also rendered by the teachers.

Over the four years, the children's receptive vocabulary grew at the rate of 43% of that manifested by hearing children. The vocabulary level reached at age eight was similar to that reported for comparable hearing impaired children at age 11 taught by other methods. There was no apparent syntax development until after the first year. For the succeeding three years, however, syntax developed at a steady and, seemingly, accelerating rate. After three years, mothers were judged, on the average, to have acquired somewhat between a beginner and an average skill in Signed English. Fathers, seemingly, did not get beyond the beginner's stage. After year four, 90% of the children simultaneously spoke and signed all discourse in the testing situation. The percentage doing so *increased* every year. The children's speech, however, remained

"The children . . . understood many of the Signed English markers."

largely unintelligible. The children showed virtually no growth in receptive vocabulary over the four-year period when the examiner spoke but did not sign. The children, while lagging far behind hearing children, understood many of the Signed English markers. The pattern of development was largely similar to that of hearing children. Expressive use of the markers lagged behind receptive comprehension by a number of years, but the pattern of learning appeared similar. It will take more time before these patterns can be conclusively established.

Vocabulary growth, as measured by the Peabody Picture Vocabulary Test, appeared to slow at a point on the test where no signs are presently available. It would appear, therefore, that the Signed English vocabulary should be enlarged and that better ways should be devised to facilitate the child's ability to read. Both these approaches are being pursued at the present time. It has been objectively demonstrated that English language development is facilitated by use of Signed English even during the course of its development. However, English language development is still relatively modest. Clearly, more effective ways to reach and teach parents and to ensure standard use by professional staff are also required.

Problems with Rate and Deletions in Simultaneous Communication

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Pairs of skilled signers (deaf and hearing) were videotaped while conversing about two prearranged topics under the following conditions:

1. Three pairs of deaf signers using Pidgin Sign English (PSE) with and without voice;
2. Two pairs of hearing signers using PSE with and without voice; and
3. Two pairs of deaf signers using a variety of Manual English forms (basically SEE II) with and without voice.

Hearing participants also had a third conversation with voice alone and no signs. The order of the topics and the signing conditions were controlled.

Individual signing and speaking rates were tabulated under each condition, followed by an analysis of the types and percentages of sign deletions under each condition. Analysis revealed that significant portions of the spoken utterance were deleted in the signed version, with greater deletions occurring under the Manual English condition. Results suggest that the significant difference in production rate of signs vs. spoken words causes major difficulties when these two modalities are forced to express the same information simultaneously.

The Gallaudet Pre-College Manual Communication Evaluation System

Dennis Cokely
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David L. Knight
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The American Sign Language (ASL) and Sign English components of the Gallaudet Pre-College Manual Communication Evaluation System were the result of a study conducted during the 1977-78 academic year. During that period of time, the system was developed, pilot tested, and implemented. The theoretical rationale for the system was derived from empirical research and resulted in a set of ASL and Sign English principles that provide the basis for an objective and diagnostic "growth towards competency" evaluation approach. This approach makes extensive use of videotape for both expressive and receptive skills assessment. The project included the development stages of item and test development, pilot testing, and implementation. High inter-rater and test reliability, rating objectivity, and content validity have resulted in a unique approach to resolving historical problems in assessing ASL and other manual communication skills in adults.

"The middle aged subjects required no more training time than the college students."

Autocuer Project Feasibility Study: Final Report

R. Orin Cornett
Elizabeth L. Kipila
Cued Speech Laboratory
Research Institute

Training of eight subjects aged 54-75 years of age, including four veterans, was initiated in April 1979. This training was carried out with the use of the keyboard training units constructed by Research Triangle Institute in connection with the research done in 1974-77 under a National Institute of Neurological and Communicative Disorders and Stroke contract with Gallaudet College. The methods of training, as well as the test materials, were the same as those used with the college students, except that signs and fingerspelling could not be used with the current subjects for explanation and communication. Thus, a greater dependency on written language and materials was necessary.

Subjects were taught to pair the appropriate display symbols and lip movements with the appropriate phonemes and to read CV (consonant-vowel) syllables. Training was continued in each case until the subject was thought to be able to score 85% or better on CV syllables at random. In one case, it was judged that the subject would not reach 85% accuracy within the period of the contract; however, the posttest was administered anyway. One subject withdrew from the project after two weeks because of medical problems associated with severe allergic reactions, not connected with the project. The other seven subjects continued until ready for final testing.

The amounts of time for orientation, pretesting, training, and posttesting for each subject were recorded. Each subject was trained for approximately equal amounts of time by three different trainer-testers, and the final testing likewise utilized equal amounts of input by the three trainer-testers. Two of the three were the same persons who worked with the Gallaudet College subjects in the earlier project.

The results of the testing were then compared with the Gallaudet College students trained in 1977. The college subjects received an average of only 18 hours of training, compared to an average of 24 for the adult deaf subjects. The average scores of the middle aged to elderly subjects (90% for CV's and 94% for phonemes) compare favorably with the corresponding scores (91% and 95%) for the 1977 college students. If the one elderly subject (74 years old) who scored lowest was not included, the average of the subjects would be 93% for CV's and 96% for phonemes.

Three conclusions are supported by the results obtained in this study:

1. The middle aged subjects required no more training time than the college students.

2. The two elderly subjects (74 and 75 years old) required more training time. One eventually matched the results obtained with college students. The other scored 75% and 86.5%, considerably lower. This subject seemed to have occasional minor memory lapses.

3. Overall, the basic conclusion, justified by the results of the study, is that middle aged subjects can be trained as readily as college students, but with more variation in training time required, and with the reservation that elderly subjects can be trained successfully only if their mental skills have not degenerated too much.

Captioning Methodologies for Enhanced Reading Level and Vocabulary Development

Pamela R. Getson
Educational Research Laboratory
Research Institute

Hearing adolescents receive much of their information and entertainment from commercial and educational television broadcasts. The same ease of access to this important source of knowledge, current affairs, and societal influences is not available to the deaf student through the commercial broadcast system, and only to a very limited extent, through the Public Broadcast System. More importantly, the level of captioning used within television programs is often difficult for deaf adolescents to understand. Two frequently employed captioning techniques contribute to the deaf adolescent with a typically lower reading level's inability to obtain correct information from captioned television programs: (a) verbatim transcriptions from the original text, and/or (b) character generation and presentation of the rapid rolling type used to coincide with frame/shot changes.

The problem of inappropriate language materials for the deaf adolescent becomes a critical variable in the educational setting. There is therefore, a need for very high interest materials with content areas appropriate for the young adult with the additional requirement that

these materials be written at a lower reading level than most materials contain. In the past, educational media materials have been recommended for captioning at the most basic reading level in order to meet the reading needs of the average deaf adolescent.

Fifty students, aged 14-20 years, were randomly assigned to two groups, those using a glossary booklet and those without a glossary. Within each of these divisions, half of the students were shown materials captioned at Level 1, and the other half received materials captioned at Level 2. Each student viewed all of the four film segments at the appropriately assigned caption level, counter-balanced for order of presentation. Each student completed a glossary pretest and a film content comprehension test immediately preceding and following each film segment. All items were written at the lowest language level employed in this study to reduce error through syntactic confusion. All response distractors utilized uniform syntactic structure in a similar manner.

A multifactor repeated measures analysis of variance experimental design was utilized to analyze the data. Main effects due to caption level, glossary use, and film-caption type were investigated. In addition, first order interaction effects of these variables were analyzed to ascertain if glossary use and comprehension was mediated differentially by film-caption type, if caption level is more important for a particular type of captioned film, etc.

The results of the study address the following topics, all of which have direct implications for the methodology to be used in visual media for deaf adolescents:

1. Recommendations for caption levels appropriate for use with the average deaf adolescent student;
2. Recommendations for caption levels appropriate for use with narrative and dialogue film types;
3. Comprehension differences relating to film and caption types;
4. Relative effects of supplemental glossary usage for comprehension of new vocabulary; and
5. Differential benefits of glossary usage with narrative vs. dialogue type films.

Factors Influencing Content Acquisition Using Selected Types of Captioned Films

Pamela R. Getson
Educational Research Laboratory
Research Institute

Since deaf students can be expected to acquire both visual and verbal information from a captioned film presentation, it is necessary to have reasonable assurance that the caption type, film type, and caption reading levels are appropriately

"Because captioning of narrative-type films is very different from dialogue captioning . . . "

matched. Studies have indicated the probable need for a variety of captioning levels which could make use of a multilevel linguistic approach. Preliminary empirical analysis tends to show that caption level choices should be based primarily on the type of information contained in the verbal film material. For example, it has been shown that if information to be learned from captions requires only lower level cognitive skills (e.g., recognition), students can more effectively utilize captions written at higher reading levels than if inferential levels of cognitive processing are required. Also, content acquisition for dialogue appears to provide the deaf student with additional information which is more readily processed. This increase in knowledge through the use of captioned dialogue material is not matched with the concurrent use of glossaries, nor with a necessarily simplified caption content reading level. In fact, these results seem to indicate that this ease of understanding may be present even with the use of a large number of more difficult syntactic structures and, possibly, unfamiliar advanced level vocabulary. It is now apparent from the widespread criticism of the sole use of either a high or low language level, that no single method can always be utilized for every deaf viewer, every situation, or every film type.

To date, no empirical investigation of situational variables which may effect content acquisition of viewers with a wide range of reading abilities has been conducted. The purpose of the present study was to determine the following:

1. What educational variables most closely effect the content acquisition of hearing impaired students using captioned films; and
2. What guidelines and conditions should be used to efficiently make decisions regarding the use of on-level vs. higher level captioning.

Forty-eight students were randomly selected from the total student population at a high school for deaf students. The random selection procedure assured sample representativeness in terms of sex, age, race, and reading level. The sample was then randomly divided into two major groups for the condition-classification of no glossary and glossary usage. Half of the students in each of these conditions were randomly assigned to view low language captioned materials while the other half were assigned identical materials captioned at a high language level. One hour segments from four films were selected for captioning at each of two levels.

Because captioning of narrative-type films is very different from dialogue captioning, which utilizes caption placement to represent directionality and position, two films were chosen to reflect each of these styles. In addition, materials were selected to represent a cross-section of content areas most often requested by teachers for supplemental classroom instruction, as well as the kind most often chosen by students for entertainment.

Analysis of the data showed that the single most important determining variable for the content acquisition success of hearing impaired students using captioned media involves their entry vocabulary level. The importance of this variable may, of course, fluctuate with the difficulty levels of film content, but over all levels of test in this study, entry vocabulary knowledge was the best predictor of success on a content exam for the films. Not surprisingly, the student's scaled SAT-HI score for vocabulary was the next most important predicator, with posttest vocabulary knowledge third.

What is of particular interest is that neither caption level nor glossary use contribute to the successful prediction of content acquisition. The direct implication is that students can acquire correct information from films captioned at both high and low reading levels.

Deaf Children's Understanding of English Metaphor

Jane H. Hamacher
Department of Psychology

There is a widespread impression and some evidence that the English vocabulary of deaf children is concrete and inflexible. Specifically, it is argued that deaf children are often not aware that English words may have multiple meanings or shades of meaning, and also, that they have difficulty understanding figurative English.

This project was designed to investigate deaf preadolescent and adolescent understanding of common English metaphors. The task required the child to match a printed sentence containing a metaphor (e.g., The dog hid under a *blanket of leaves.*) to one of three pictures. One picture depicted the metaphor (e.g., a dog hiding under a pile of leaves), another a literal interpretation (e.g., a dog hiding under a real blanket with some leaves in the background), and the third, a plausible but incorrect inter-

pretation (e.g., a dog hiding behind a tree, partly obscured by falling leaves). There were 15 sentences in all.

Preliminary results with 40 Canadian deaf children (ages 10, 12, 14, and 16 years) indicated that the children tended to select the literal interpretation of the metaphor (dog under real blanket), tentatively supporting the view that deaf children's understanding of English vocabulary is concrete. However, a posttest in which the literal alternative was replaced with another nonliteral, plausible but incorrect alternative, suggested otherwise. Under these conditions, the children were able to select the correct pictorial interpretation of the metaphor. This finding suggests that deaf children may be able to interpret common English metaphors correctly, provided there is no literal alternative available to distract them.

Comparison of the Affective Language Domain of Hearing and Hearing Impaired Students

Anna R. Hauptman
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Research Institute

The similarities and the differences of the connotative language domain of hearing and hearing impaired students were investigated in the present study.

It has been shown that the processes by which attitudes (behaviors) are formed is similar to those by which emotional or affective meanings are formed. Thus, connotative language analyses can provide some insight into the attitudinal differences between groups of people. If different groups share similar meanings for specific concepts, the understanding and interaction between them is closer, more harmonious, and less conducive to social problems. The degree of identification is the prime variable in the interactive or integration process of a subcultural group. Research suggests that the degree of identification, on both an individual and group basis, is dependent upon the sharing of common connotative language meanings. Thus, the degree of identification between the deaf and the hearing communities can be measured in part by the connotative meanings these groups hold for basic cultural concepts. Research also suggests that differences exist in the way the affective domain of the hearing impaired person develops.

In the present study, a semantic differential measuring instrument which was developed and used in earlier studies at the University of Maryland and Catholic University was adapted to the language needs of hearing impaired students.

Data were collected from four different groups of subjects—90 students in all. Participating schools were the University of Maryland, Gallaudet College, Maryland School for the Deaf (Frederick), and the Fort Worth Regional School for the Deaf. The methods of data analysis were a factor analysis based on an intercorrelation matrix of scales taken across mean concept ratings (Osgood's D Value) and a comparison of the different groups to determine in which ways the students are most dissimilar (or similar) on a given set or cluster of variables. The results showed a significant difference between the hearing and hearing impaired groups of students. The analyses gave evidence of a different and more divergent affective domain both within the hearing impaired groups and between the hearing impaired and the hearing groups.

Information Processing Structures

Anna R. Hauptman
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In this theoretical study, the relationship between bilingualism and cognition is viewed within the context of the information processing model of Driver, Schroder, and Struefert and the cognitive differentiation theory of Herman A. Witkin. The implications of the emerging hypotheses were then related to the hearing impaired language learner. Some of the questions addressed in the paper were:

1. What are the cognitive processes by which an individual acquires a second language?
2. Are the elements and sequences of these processes the same as those used in the acquisition of the native language?
3. What is the relationship between cognitive style development and bilingualism?
4. What role does bilingualism play in the development of attitudes and personality structures?
5. Can the processes of second language acquisition as hypothesized for the hearing person be analogized to the hearing impaired language learner?
6. If so, what implications does this have for the teaching of language in schools for hearing impaired students?

"Implications are drawn . . . for IEP development for the hearing impaired student."

The different key constituents which figure in the acquisition of a second language are applied to the hearing impaired or deaf language learner. The manner and sequence of acquisition of the different language systems and the effect on the development of the cognitive and personality structure of the student are discussed. An information processing model for bilingualism is presented. Implications are drawn from the model for the teaching of language (process and content), for the design of curriculum materials, and for IEP development for the hearing impaired student.

An Update of Communication Trends Within Programs for Deaf Students

Irving King Jordan
Department of Psychology

A survey was conducted of the most commonly used modes of communication within schools and programs for the deaf around the country. The research results of the project, cooperatively done with Gerilee Gustason and Roslyn Rosen, were reported in an article which appeared in the *American Annals of the Deaf* in June 1979. The results show a clear and continuing trend toward the use of total communication. Additional information about the number of mainstreamed hearing impaired students and the provision of interpreters for them is also presented.

Timing Sensitivity and Age as Predictors of Sign Language Learning

Irving King Jordan
Department of Psychology

This research project, done with Carol Bergfeld Mills of the University of Maryland, has been submitted for publication to *Sign Language Studies*.

A timing sensitivity test was developed and administered to students enrolled in sign language classes at Gallaudet. The intent of the study was to correlate four measures of sign language learning, i.e., semester grade in a sign language course and fingerspelling, signing and overall expressive skills as evaluated by sign language teachers with timing sensitivity, sex and age.

The results revealed two predictors of sign language learning, timing sensitivity and age. People who are more sensitive to timing features learn sign language better than people who are less sensitive, and younger adults learn sign language better than older adults.

The Ability of Hearing Impaired Children to Comprehend the Semantics of English Prepositions

Thomas N. Kluwin
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The purpose of this study was to investigate the acquisition of specific preposition meanings by hearing impaired children while controlling for the selectional restrictions placed on preposition meanings by the syntax of the sentence or the semantics of the verb phrase.

Comprehension tests of English preposition usage were given to 200 students from two secondary schools for the hearing impaired. The tests were constructed by generating 60 sets of prepositional meanings in simple prepositional phrases. The use of prepositions as adverbs in verb plus particle constructions was not considered. Three items were written for each construct. The resulting 180 items were randomly divided and given to the 200 students in groups of 45 items. Each individual student responded to only 45 randomly selected items.

Previous research with preposition production had shown that locatives were acquired before prepositions involving manner relations. This general finding was true within individual preposition meanings. For example, half of the meanings of "on" used in a locative sense were prior to any meanings of "on" expressing manner relations. However, the other half of the locative uses of "on" acquired were after the manner usage of the same preposition. The controlling factor was the environment in which the specific prepositional usage occurred. The comprehension of "on" as a locative progressed from the comprehension of the relationship of being above and in contact with a surface through contact with a non-horizontal surface to indicating a relative position. The acquisition of manner usages followed a similar pattern. A second example would be which comprehension of "of" proceeded from meanings involving relatively concrete notions of possession or kinship through more abstract relationships involving representation or participation to similar kinds of

" . . . approaches to language development for hearing impaired children are identified."

semantic relationships that required specific morphological structures such as noun possessives or comparatives of adjectives as objects of the preposition.

The results of the study suggest that there is a clear developmental sequence in the acquisition of English prepositions by hearing impaired adolescents. The sequence of principles cannot be defined simply in terms of the general relationship to be acquired. Defined this way, prepositions are acquired as locatives, then temporals, and then manner relationships. Specialized prepositions are acquired within this framework, but no principle is described for their acquisition. Second, preposition meanings are acquired from their most generalized meaning within a category to their most specialized meanings. Third, increasing syntactic or morphological complexity within the simple prepositional phrase delays the acquisition of the prepositional meaning.

The implication of the study is that a "spiral" occurs in the acquisition of the meanings of the preposition. The spiral turns upward through the addition of various kinds of rules. Language training programs must take cognizance of the spiral, its principles, and the resulting sequence.

A General Model of English Language Development for Hearing Impaired Children

David L. Knight
Educational Research Laboratory
Research Institute

The model of English language development detailed in this study describes the linguistic factors and processes bearing most heavily on the reading competence of hearing impaired children. The model addresses language development of deaf children from birth to approximately 6-7 years of age. It is one part of a collaborative model building effort ultimately focused on the development of reading competence in hearing impaired children.

The purpose of the model is to provide a framework for addressing research questions and generating research hypotheses in this vital area of education of the deaf. Three major aspects of English language development are used to organize the discussion. First, the general model of the acquisition of English language is developed. Second, six criteria are developed that index the degree to which a given language development approach approximates typical native language learning environments. And third, approaches to language development for hearing impaired children are identified. Each block of the language development model is then discussed in terms of the approaches to language development and the degree to which the approaches meet the criteria for native language learning environments. Consequently, the study provides a three-way analytic matrix of language development factors leading to the acquisition of reading competence for hearing impaired children.

An Evaluation of the Woodward Language Assessment Procedure

David L. Knight
Educational Research Laboratory
Research Institute

In this study, a procedure for assessing the written English language capabilities of hearing impaired students developed by Helen Woodward and used at the Central Institute for the Deaf over the past several years was investigated. Although lacking rigorous psychometric development, the procedure possessed several potentially appealing features. These features included a criterion-referenced orientation, the focus on the interaction between ideas (content) and language, and a strong diagnostic component. The purpose of the study was to evaluate the potential features and the psychometric properties of the procedure according to six criteria of adequate language assessment proposed by the investigator.

Four raters were trained in the procedure and 32 students provided test results for analysis. Inter-rater reliability and concurrent validity indices indicated that the procedure possessed sound psychometric characteristics. In addition, it was judged that the procedure provided valuable diagnostic information and was able to appropriately separate content and form in analyzing student responses.

While problems with the procedure were found to exist, it was generally concluded that the procedure was a viable language assessment tool that had broad applicability within instructional programs for the hearing impaired.

The Effectiveness of Computer Assisted Instruction in Teaching English Language Structures

James Madachy
English Department

In the English Language Program at Gallaudet College, Computer Assisted Instruction (C.A.I.) is used extensively. The C.A.I. lessons were created by faculty and staff on campus and were in a TESOL (Teaching English as a Second Language) format. In effect, usage of the English language was stressed rather than the rote grammatical approach so common in most C.A.I. programs.

The purpose of this research was to determine if C.A.I. lessons were as effective in teaching English language structures as other currently used methods (specifically, teacher-to-student lectures and conferences, and pen and paper materials).

Records of work completed by approximately 100 students were obtained. The tasks performed on the computer were then compared to their equivalent tasks through the lecture on pen and paper method. A typical task or area, for example, was changing a statement into a question in the past tense. As a basis for comparison, the Language Program's placement test results were used which contains pre- and posttests in the areas of structure, vocabulary, reading, and free writing. Scores only for those students who had shown a 10-point increase in any one of the three areas of structures, vocabulary, and reading were then compared. The results were that students who used C.A.I. lessons did as well as those students using a lecture or pen

and paper method. A comparison between students who use only C.A.I. vs. students who use a combination of C.A.I. and other methods showed that a combination of methods produced the most improvement.

Based on these findings, the English Language Program uses a combination and variety of methods to teach structure, vocabulary, and reading skills. The English Department plans future research into the effect of randomized C.A.I. lessons and statistical analysis of which battery of testing devices best indicates success in English courses at Gallaudet College.

An Automated Newborn Hearing Screening Test (Crib-o-gram)

William H. McFarland
Department of Audiology

Most authorities realize the importance of identifying hearing losses as early as possible. Behavioral neonatal hearing screening procedures have not met with great success. In September 1970, a joint committee comprised of members of the American Academy of Ophthalmology and Otolaryngology, the American Academy of Pediatrics, and the American Speech and Hearing Association issued a statement on neonatal hearing screening. The statement indicated that behavioral research could develop improved hearing screening techniques. The present study is an evaluation of the crib-o-gram, a new neonatal hearing screening test.

The crib-o-gram is an automated hearing screening device. It is comprised of a control unit which is attached to a motion sensitive transducer imbedded in a silicone elastomer pad. This pad is placed under the baby's crib in the newborn nursery. In addition to the transducer, a speaker is connected to the control unit and is placed at the foot of each baby's crib. The control unit contains a strip chart recorder which monitors the movement of the baby as sensed by the transducer. A timer allows interstimulus intervals to be present so that the crib-o-gram will turn itself on and run for 30 seconds and then turn itself off automatically several times each day. When the unit activates itself, the strip chart starts recording baby motion for 20 seconds prior to the presentation of a 92 dB stimulus. The baby's activity continues to be recorded during the presentation of the stimulus and for 10 seconds after. Approximately 30 stimulus trials are available on the strip charts in addition to several silent control trials.

A total of 10,497 well babies in the well baby nursery and 1,576 babies in the intensive care nursery at Stanford University Medical Center have been tested with this device.

The procedure for testing babies is one where an audiologist goes to the nursery once each day to set up the equipment. Equipment setup time takes approximately five minutes. The equipment is activated and left for the next 24 hours when the audiologist then returns to the nursery to move the crib-o-gram to a new baby. At this time the strip chart from the previous day is scored. Approximately five minutes are needed to score this strip chart using predetermined fixed quantitative criteria.

All fail babies were followed up by means of followup testing when possible. Pass babies were followed up through questionnaires to the pediatricians and parents to determine whether or not the possibility existed of a false negative error (passing a baby with a definite hearing problem).

Of the total 12,073 babies tested, 39 hearing impaired babies were discovered (11 from the well baby nursery and 28 from the intensive care nursery). The incidence of deafness in the well baby nursery has been established at 1 in 954 while the incidence in the intensive care nursery is 1 in 56.

The false positive and false negative rates were based on partial followup data because of the difficulty in getting babies back for retest or because of incomplete return questionnaires. Approximately 79% of well babies and 87% of intensive care babies who failed the screening were able to be brought in for retest or to be followed through other clinics. Based on these babies, false positive rates of 8 and 21% were observed in the well and intensive care nurseries, respectively.

Computation of the false negative rate depended heavily on information from the 18-month questionnaire and subsequent followup tests on those suspect pass babies. Parents of pass babies returned only 35 and 42% of the questionnaires for well and intensive care babies, respectively. False negative rates were .001% for the well baby nursery and .31% for the intensive care nursery. Both nurseries combined yield at a false negative rate of .05%.

A totally new crib-o-gram is now being evaluated. This device utilizes the same principles described above; however, it incorporates a microprocessor to perform the test and to score and interpret the results. Preliminary analysis of the microprocessor

indicates that it is capable of detecting the same number of responses and nonresponses that the human scorer can. Improved decision criteria and different test strategies are now being programmed and evaluated in the microprocessor version crib-o-gram.

The crib-o-gram appears to be an effective neonatal hearing screening test. It is currently detecting 93% of the hearing impaired babies present in both the well and intensive care nurseries. The discovery of an incidence of hearing impairment of 1 baby in 56 in the intensive care nursery at Stanford is quite disturbing. This indicates that neonatal hearing screening should be mandatory in intensive care nurseries. Incidence of hearing impairment in the well baby nursery of only 1 in 954 babies is sufficiently small that mass screening with the crib-o-gram or any other device or test may be impractical.

A Comparison of Reaction Time and Reaction-Movement Time in Deaf and Hearing Freshmen College Students

Martin Minter
Department of Physical Education and Health

In a reaction and reaction-movement test conducted at Gallaudet College and Catholic University, it was found that deaf and hearing students did not show any statistically significant differences on a simple reaction time test.

A second part of the experiment was a reaction-movement test in which the task was to extinguish lights on a display panel by selecting and pushing an appropriate button. On this latter task the deaf students were found to be significantly better than their hearing counterparts. The tentative conclusion is that the constant use of eyes and hands in sign languaging for communication enables the deaf students to react faster than their hearing counterparts.

Conversational German: A New Approach Through the Use of Cued Speech

Janice D. M. Mitchell
Department of Foreign Languages

The objectives of this study were to bring a new dimension to the teaching of German conversation at the undergraduate level and to enable the hearing impaired student to acquire an even more accurate model of verbal language through the use of visual-lingual aids and Cued Speech.

The hearing impaired student's progress in understanding a language has often been encumbered by his inability to acquire a visual language model. Through the use of clear communicative tools, however, he may acquire a total understanding of language. He can, then, add a spoken understanding to his foundation of reading and writing skills. Earlier courses offered in conversational German were, for the most part, chosen by students having already acquired speech patterns or by German majors. With the advent of a study abroad program with increasing numbers of deaf students participating in it, it seems that an elective course in conversational German would be popular among the students. The addition of Cued Speech as an instructional tool would permit active participation in the course, thus making the introduction of more varied and advanced language utterances possible.

Ten profoundly deaf and hard of hearing students enrolled in a required German course during the fall 1976 and spring 1977. Concurrently, the students selected the conversational German course as an elective with full awareness that Cued Speech would be the communicative tool for learning the language.

All of the students achieved at least minimal spoken facility in German. Each also showed marked improvement in vocabulary acquisition and retention over their previous experiences in the classroom as a direct result of the spoken component Cued Speech. Most beginning hesitancies in using Cued Speech were exhibited by the hard of hearing students although they admitted it helped them clarify their pronunciation.

Language Proficiency and Creativity in Hearing Impaired Adolescents

Tad Uno
Educational Research Laboratory
Research Institute

In this study, the relationship between verbal and figural creativity and English language proficiency scores in 112 hearing impaired students was examined. The students were randomly assigned to take either the verbal or figural versions of the *Torrance Test of Creative Thinking*. Reading and vocabulary scores on the *Stanford Achievement Test* (hearing impaired version) were significantly correlated with figural fluency, flexibility, originality, and elaboration while similar correlations

were obtained with all verbal creativity measures except elaboration. Regression analyses indicated that the SAT measures accounted for approximately 35% of the figural creativity variance and 70% of the verbal creativity variance. The data also suggested the presence of a unique perceptual style in the female students possibly resulting from a significantly high degree of hearing loss.

Language and Communication: Current Research

Basic Skills in English Project

Freshman/Sophomore Sub-Committee on Evaluation and Standards
Department of English

The Evaluation and Standards Sub-Committee was set up by the Freshman/Sophomore Instructional Group of the English Department to answer questions vital to the coordination of its program. Many professors have difficulty accommodating individual student differences while at the same time maintaining collegiate standards, and they are concerned over problems in teaching classes of students whose language skills seem to be increasingly disparate. Responsible decisions can be made about such suggested remedies as tracking or individualized instruction only after gathering more objective data about students' abilities and performance in the program than was then easily available for study.

This Sub-Committee was formed to gather definitive information about the language abilities of students and to investigate practical means of measuring students' development of language skills in the English program. (This limited focus was agreed upon despite the prevailing view of the instructional group's members that mastery of basic language skills would ideally be the starting place of the program.) The Sub-Committee was charged with investigating the following questions:

1. What kind of test best predicts success in college work (aptitude or achievement tests, reading, vocabulary, etc.)?
2. What sort of test or performances best measure achievement in language, composition, and reading?
3. What in-house or commercial tests will validly measure the range of the students' skills? (The range may require more than one kind of measurement.)
4. How much progress is actually made by the students in reading and writing skills and course content during our two-year program?
5. What is a workable threshold for entrance into Freshman English?
6. What competency levels should be set for program mastery?
7. What specific programs (e.g., associate degrees, certificate programs, etc.) might be more appropriate for students who cannot develop language skills necessary for baccalaureate degrees?

The Sub-Committee has begun to study the suitability of both locally prepared and commercial tests of English skills for use by the students. As part of this work, results of a number of tests administered to Gallaudet students upon entrance to the college will be brought into one "data-base." These tests include the Gallaudet entrance battery, the Cooperative School College Abilities Test (S.C.A.T.), the Sequential Test of Educational Progress (S.T.E.P.), and the English Placement Test. In the same data-base, it is planned to include students' grades, cumulative hours, and their cumulative averages in the English program.

Development of the Autocuer

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Cued Speech Laboratory
Research Institute

The Cued Speech Laboratory is currently engaged in a three-year project to improve, miniaturize, and field test the Autocuer. Presently, 15 Gallaudet students are being trained for use as subjects in the evaluation of the Autocuer's output in various stages of its development. Their ability to read the output with various iterations of the speech analysis program will be evaluated.

Under the terms of a contract from NASA Goddard Space Flight Center, the Cued Speech Laboratory will provide technical services to assist Research Triangle Institute (RTI) in the development of a Speech Autocuer. During the term of this subcontract to RTI, the Cued Speech Laboratory will provide personnel, services, and facilities to train a group of 8-12 hearing impaired college students on perfectly cued CV (consonant/vowel) syllables, words, and simple phrases, in preparation for using them to evaluate speech-analyzer-cued output for the following purposes:

1. To study differences caused by inaccuracies in the speech-analyzer cues;
2. To collaborate with RTI in arriving at decisions regarding modification of the speech-analysis program to improve subject performance; and
3. To arrive at estimates of the amount and kind of pretraining needed for field test subjects.

The project will also develop the necessary training and evaluation materials on videotape in order to

carry out the testing described previously. It is understood that the accomplishment of the testing program is contingent on the refinement and operational availability of the speech analyzer, as achieved by RTI.

The Cued Speech Laboratory will also plan and prepare materials for the training of field test subjects. It will select and train the subjects and carry out the field test. RTI will fit the field test units to the subjects and maintain and service them throughout the field test. RTI will also collaborate with Gallaudet College in the solution of technical problems and the redesign of equipment necessary for making the videotape training and testing materials. The redesign will be necessary if a physical move of the Gallaudet Media Center to a location more distant from the Cued Speech Laboratory makes it impossible to continue to use a coaxial cable link between the two.

The Cued Speech Laboratory will maintain complete records of all training and testing activities and results. They will analyze and report them to RTI whenever relevant and important findings are available. RTI will collaborate in decisions regarding needed changes in training and testing techniques and materials.

Interaction of Deaf Mothers and Deaf Children

Carol Erting
Kathryn P. Meadow
KDES/MSSD Research Laboratory

The purpose of this study is to investigate the communication modes and strategies of mothers and children when both members of the pair are deaf and where some form of visual language is utilized. Seven mothers and children enrolled in the Kendall School preschool program will participate.

Videotaped samples of mother-child interaction have been collected in the studio using a format that encourages unstructured interaction. An exceedingly painstaking and complex transcription of the language and the interaction is being completed by native signers, with the assistance of the subject mothers trained to translate sign into English glosses. Transcripts and tapes will be coded for mode and functional communication. These data will be compared with data collected previously by Mark Greenberg allowing for a four-group comparison. The other groups include: hearing mothers and deaf children using total communication, hearing mothers and deaf children using oral communication, and hearing mothers and hearing children using spoken communication.

Perception of Complex Auditory Stimuli by the Deaf

J. M. Pickett
Sally Revoile
Sensory Communication Research Laboratory Research Institute

Persons with moderate, severe, and profound sensorineural hearing impairments often have difficulty understanding speech (discriminating speech sounds). This difficulty occurs even when the hearing impaired person is using hearing-aid amplification or listening at optimum levels. The purpose of the project is to investigate the auditory capacities of hearing impaired persons to discriminate various patterns of complex auditory stimuli, especially those that are important in speech perception. Various experiments are being conducted to study impaired auditory reception for synthetic, speech-like sounds and to study discrimination of real speech.

The subjects participating as listeners are, generally, hearing impaired undergraduate students at Gallaudet College. The listener's task is usually to discriminate certain acoustical differences among several speech-like sounds presented in series to identify a single speech-like sound or speech sample from among a small group of possibilities. The sounds the listeners hear are presented from a computer, which also records and stores the listeners' responses. Further descriptions of some of the experimental sounds are provided in the following examples of some recent research.

In several experiments, the effect of a synthetic vowel on detection and discrimination of consonant-like noise bursts was studied. In speech, the noise-bursts of certain consonants can be used as cues for their discrimination by persons with normal hearing. Consonant noise-bursts usually occur adjacent to vowels, which generally have greater energy than the noise bursts. In the present research, it was of interest to examine whether a synthetic vowel would affect the auditory reception of consonant-like noise bursts. It was found that the vowel produced negligible interference for the detection of the noise bursts for hearing impaired listeners. However, discrimination of the noise bursts was affected by the vowel for some hearing impaired listeners.

"Work to date has revealed approximately 20 different facial signals with linguistic functions . . ."

In another series of experiments, the discrimination of duration for vowel transitions was investigated. The transitions of vowels occur adjacent to consonants in speech. Differences in the duration of transitions can be used as cues by normal hearing persons for discriminating certain consonants. It was of interest to examine whether synthetic vowel transitions of various speech-like durations could be discriminated by hearing impaired listeners. The results showed that most of the hearing impaired listeners showed poorer discrimination of transition duration than did the normal hearing listeners. For the higher frequency transitions, some hearing impaired listeners could not discriminate differences in duration that represented the largest transition duration differences found in speech.

The results from these studies provide basic information about the auditory reception of speech sound-patterns by hearing impaired persons. Such information will aid in the understanding of the speech discrimination problems of the hearing impaired. For example, the inability to discriminate consonant-like noise bursts or to discriminate transition durations may be factors in discrimination difficulty for certain consonants in speech.

Non-Manual Behaviors in American Sign Language Discourse

William Stokoe
Charlotte Baker
Linguistics Research Laboratory
Research Institute

A project is being conducted in which a detailed definition and description of the linguistic functions of other than normal behavior in American Sign Language (ASL) is being sought. Data from natural conversations and from elicitation procedures are being coded along five channels of transmission: the eyes, the face, the head, the hands and arms, and body movement. The Facial Action Coding System recently developed by Ekman and Friesen is being used to transcribe facial behavior in microscopic detail, recording changes distinguishable in 16 millisecond intervals. A recent reliability test involving Charlotte Baker and C. Camras, a coder unfamiliar with ASL, showed surprisingly high agreement for this kind of detailed transcription of continuous facial behavior.

Work to date has revealed approximately 20 different facial signals with linguistic functions and has begun to isolate a variety of important uses of the eyes and head in the syntactic use of space. Concurrently with the investigation of other than manual behavior, William Stokoe is incorporating the findings into an ongoing revision of the 1960 and 1965 analysis of the manual transmission system of ASL.

The Effect of Presentation Mode and Time on Word Associations in Deaf Subjects

Robert Lee Williams
Carol Bergfeld Mills
Department of Psychology

Many theories of meaning concern the importance of semantic features in the processing of language. The role these features may play in word association tasks has been discussed by numerous researchers. It would appear that word association teases out two general classes of features: (a) those related to the physical characteristics of the lexical items which often show up in clang associates, such as a rhyme, e.g., bit-pit; and (b) those which make up the semantic substructure of the lexical item which show up in associates based on meaning. In word association tasks where the subjects are instructed to answer quickly, their responses show a high proportion of clang associates. Given more time, subjects produce associates based on semantic attributes, e.g., black-white. Instructions to the subjects to take even more time before responding, yield a high proportion of idiosyncratic responses.

In American Sign Language (ASL), the physical characteristics of a lexical item are clearly very different from a spoken word. For English associates, a clang response is based on the sound pattern of the word, while in ASL, a clang response is based on a visual pattern of the sign. ASL can be analyzed in terms of features called cheremes. Cheremes are analogous to phonemes in that they represent an analysis of the physical characteristics of a sign

in terms of four distinctive feature bundles: (a) hand configuration, (b) location, (c) movement, and (d) orientation. There have been several studies which have shown the influence of these in recall tasks. The exact extent of the influence of these feature bundles, and the specific manner in which they might operate has yet to be detailed.

Word association techniques have been used to probe lexical structure in a different way than traditional recall tasks. The ability to produce word associations is presumably derived from the ability to understand and produce language. Thus, analyzing word association data can reveal information about the storage, retrieval, and usage of words. When using word association tasks with deaf subjects, written stimuli have yielded data similar to hearing norms although responses are somewhat more graphemic. Graphemic responses may indicate that the visual characteristics of the word have more influence on deaf subjects than on their hearing counterparts.

The present study is designed to examine the effects of presenting the word association stimuli in sign language on videotape. Presenting signed stimuli, rather than written stimuli, should encourage visual clang associates which may or may not reflect feature analysis of signs. The two different time constraints, normal speed (self paced) and fast speed, should reveal differential effects of the physical characteristics of the sign similar to the clang associations collected from hearing populations. The stimuli for this experiment will be selected so that they have a wide range of coefficients of uncertainty. Furthermore, the stimuli will be selected so that some will have a common response which differs from the stimuli by three or more feature bundles, e.g., *animal-dog*, while others will have a common response which differs by only one feature.

In a second experiment, the same stimuli will be presented to deaf subjects, but in a written form rather than in a signed form. The comparison of responses in the two experiments will reveal what effect the mode of presentation has on association responses.

In a third experiment, the same written stimuli will be used as in the second experiment, but hearing subjects will be used for further comparisons.

Language and Communication: Projected Research

A Simpler Manual System for Special Learners

Harry Bornstein
Irving King Jordan
Department of Psychology

Many special learners, such as those who are mentally retarded, autistic, cerebral palsied, and others, find the citation form of many signs difficult to learn and/or execute. It should be possible to describe the salient features of the citation form of an appropriate corpus of signs in such a way as to guide special education teachers in their teaching of signs to students, and to determine the ease or difficulty of different aspects of executing these signs. Subsequently, these two aspects of a sign system, perceptual salience and ease of execution, can be balanced into an optimum system for different types of learners.

A specific question to be addressed is: What features of a sign are easiest to perform or execute?

The subjects of the study will be a large number of experienced signers. They will view videotapes in which movement, location, and hand formation will be controlled. The corpus of signs to be used will be a distillation of published manuals of vocabulary for retarded persons.

Signed English Readers

Harry Bornstein
Signed English Project
Research Institute

In order for a deaf child to further develop his language ability, it is likely that he will need to learn to read well and at an early age. It is believed that this will require a specially designed series of readers.

In this project, a series of readers will be developed which will provide a guided transition from recognition of a pictured sign to recognition of the printed word. There will be a built-in progression from a simple association of sign to word, of sign to a class of word synonyms, and finally, of learning to read and comprehend new words primarily from context. Because the basic logic calls for associating the unknown to the known, readiness exercises will be integral parts of the series.

Cued Speech Test Certification Program

R. Orin Cornett
Cued Speech Laboratory
Research Institute

Research is being planned to develop and test certification procedures and materials for Cued Speech teachers and interpreters.

Developing an Automatic Cuer

R. Orin Cornett
Cued Speech Laboratory
Research Institute

The Cued Speech Laboratory is continuing its work on an Autocuer contract through August 1982. Although this consumes most of the staff's available research time, it is hoped that additional video materials for use by parents and teachers can be developed. In addition, the Laboratory hopes to put Cued Speech into additional languages and to produce Cued Speech lessons in languages other than English.

Phonology and Language of Preschool Children

R. Orin Cornett
Cued Speech Laboratory
Research Institute

In collaboration with Gaye Nicholls of Canada, the Cued Speech Laboratory is planning research on interrelationships between the developments of phonology and language by preschool children. The Cued Speech Laboratory's role in the research will be that of advisement and will not involve coauthorship since it prefers that most research on Cued Speech be done by other research projects.

New Program Development in International and Foreign Language Studies for Deaf College Students

Carol N. Frankel
Catherine Ingold
Romance Languages Department

The purpose of the project will be to design and implement a program whose aim is to expand accessibility of foreign area studies and foreign language studies to deaf students. To this end, the project participants will investigate successful area studies programs at other colleges and universities, identify teaching methods, technologies, and curriculum designs which are appropriate for deaf college students, and then, implement model programs in Western European Area Studies and Latin American Area Studies. Major project goals will be to make area studies and foreign language studies available to deaf students as a major field, to enhance the

" . . . instructional use . . . will be assessed through measurement of content acquisition, semantic knowledge, and interactions of reading level of captions . . . "

international component of other Gallaudet programs, and to prepare materials in area studies and foreign languages for national dissemination to other postsecondary programs with deaf students.

An Investigation of the Utilization of Three Captioning Techniques by Hearing Impaired Students

Pamela R. Getson
Educational Research Laboratory
Research Institute

As proposed, this study will involve the determination of variables which must be considered when edited narrative films, edited dialogue films, and/or verbatim film of any type are utilized with elementary, secondary, or college-level students. Comparisons of the feasibility of instructional use for these categories will be assessed through measurement of content acquisition, semantic knowledge, and interactions of reading level of captions with the assessed student reading level. Implications for the results include: (a) considerations for use of captioned presentations with the level of student, type of film, type of captioning technique, content of film, and intent of instruction; (b) presentation of semantic and syntactic interactions with knowledge acquired from visual print information; (c) guidelines for individuals selecting captioned materials for instruction at a variety of student age and ability levels; and (d) guidelines for caption writers/editors when processing requests for captioning of films for specific audiences and instructional purposes.

The Relationship of Caption Content Comprehension and Prior Semantic Information

Pamela R. Getson
Educational Research Laboratory
Research Institute

Previous work by researchers in a number of different applications points to the conclusion that not only are the variables of film type and student reading level important for understanding the content of visual media presentations, but also the specific semantic abilities of the student. A simple measure of the student's reading comprehension and/or vocabulary level through the use of a standardized test (e.g., SAT-HI) can only partially account for the variability between the actual and predicted comprehension scores found for a group of students using various captioned film and format styles. Work completed on factors which delineate successful captioned content acquisition indicate that the most important single facet may be the students' acquired or preinstructed vocabulary. The purpose of this study is to determine the effects of prior semantic facility with specific caption-imbedded vocabulary which is dependent for understanding of the film content.

In an earlier study, subjects were randomly selected from the total student body of a high school for the hearing impaired. Subsequent random assignment of students to film condition and vocabulary condition provided the sequencing for a three-way repeated measures analysis of variance under the conditions of preteaching and no preteaching of relevant vocabulary. Students viewed four separate one-hour film sequences. Vocabulary knowledge was assessed through paper and pencil administrations of tests pre and post-treatment. Separate instrumentation was used to determine individual levels of the captioned content which was acquired.

Subsequent analysis of the data will lead to results indicating:

1. Relative importance of preteaching or prior information for adequate understanding of captioned format materials;
2. Differences between formats and the understanding of necessary imbedded vocabulary;
3. Suggested instructional modes to be utilized by teachers in conjunction with certain kinds of captioned instructional media;
4. Considerations which should be included in guidelines for the edited or rewritten versions of captioned films which are of different formats and/or will be used in various classroom situations; and
5. Format for studies which will replicate (or refute) necessary semantic considerations for the generation of adequate edited captioned materials for high school level viewers.

The Incorporation of English through Visual Representational Systems

David L. Knight
Educational Research Laboratory
Research Institute

Hearing impaired children must rely heavily on vision as a channel of communication. Recently, various visual/manual means of representing

English (e.g., Cued Speech, SEE II, etc.) have been proposed and implemented within educational programs for the hearing impaired. While a good deal of controversy has been generated, little empirical support has been offered regarding the fidelity of the representational systems to English, or more basically, whether it is the system itself or English which the child internalizes. The answers to these questions have obvious implications for educators of the hearing impaired and for the ultimate efficiency of the systems.

Consequently, it is proposed that a series of investigations be initiated to directly deal with the most basic of the questions, that of what the child internalizes when exposed to a representation of English. That is, can a language based in one modality be meaningfully represented through a different modality? If so, what parameters are important in producing the most efficient means of representing English?

This series of investigations would hopefully provide empirical grounds for a more scientific approach to representation of spoken language than heretofore has been the case within the field. Other investigations are currently planned that deal more directly with the fidelity of the visual/manual representation of English.

Sign Language Overview (1972-Present)

William Stokoe
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Research Institute

Research at the Linguistics Research Laboratory and at several dozen centers in the United States and abroad are being scanned, evaluated, and the results integrated so far as possible into a comprehensive view of sign language and its cultural as well as psychological implications. This is being done with all current and past Linguistics Research Laboratory personnel, contributors to Sign Language Studies, and other colleagues. Whether final reporting will be on two levels, for laymen and for language scientists, or on one has not yet been determined.

Comparisons of Sign Language Grammatical Structures

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Susan De Santis
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Research Institute

The purpose of this project is to examine hypotheses that had previously been made by linguists about the general nature of sign languages. These hypotheses have been based on research that was almost exclusively done on American Sign Language. Desiring a broader data base for such hypotheses, the investigators are comparing available linguistic data from nine different sign languages from five different sign language "families." Some of the sign languages have not been used for educational purposes and thus show little influence from oral languages. Two of the sign languages are from isolated islands, and these two sign languages bear no historical relationship to any other known sign language. From 1976 to the present, the focus on this project has been in relation to language attitudes towards sign language across cultures and to a comparison of formational systems across sign languages. The remaining two years will concentrate on comparisons of grammatical structures among some of these sign languages.

Changes in Information Content and Style in the Transmission of Rumor-Like Material

Robert Lee Williams
Susan Anthony
Department of Psychology

The research dealing with the transmission of rumor-like material has two heritages, one is cognitive psychology and the other is social psychology. In the field of psychology, Sir Frederick Bartlett was the first researcher to examine changes, especially those involving reorganization and reconstruction in verbal material over time. In his book *Remembering*, Bartlett emphasized the distortion that remembered and transmitted material undergoes. At a time when S-R psychology was at its height, his conception of remembering (not memory) as an active and reconstructive process rather than a passive photograph was not received with great acclaim. Although his work includes experiments on perceiving (not perception) and recognizing (not recognition), the focus of the present proposed study centers on the remembering and transmitting of stories.

Barlett's method of serial reproduction, which developed out of his interest in folk tales which are passed along by word of mouth from generation to generation and the changes they undergo, will be used in the proposed study. Basically this method involves the first subject receiving a story, waiting 15 minutes, and then

retelling it to a second person, who then waits 15 minutes and tells a third person and so on until the story has been reproduced about 10 times.

Perhaps of most interest is the effect of the structure of the stimulus story itself. If one presents a story in which the deaf and hearing cultures are interfaced, one might expect that the deaf students would identify with the deaf characters in the story and therefore be more accurate or elaborate in their rendering while forgetting the details of the hearing characters. Further, it is often said that to be truly precise, one fingerspells a word. If this is true, one might expect information presented in fingerspelling to undergo fewer changes. On the other hand, Bartlett found that names are usually forgotten and since names are usually fingerspelled, an interesting conflict is set up. Possibly the most ephemeral part of sign language is gesture, mime and such. People often trace the shape of objects in the air to get across some point for which no sign or fingerspelling would suffice. One could make a convincing case that information presented through this mode would undergo the most radical changes of all.

The subjects for this experiment will be Gallaudet College students whose native language is ASL. There is a constellation of criteria for determining the students' native language including having deaf parents, the age of onset, the amount of hearing loss, and the stated perference of ASL over Signed English. Approximately 50 subjects will be necessary. They will be shown a black and white videotape of a story. Each subject's retelling will also be videotaped in black and white using a portable Sony video recorder.

The story will be prepared on videotape by a fluent native speaker of ASL using ASL, will last about 5 minutes, and will contain the following elements: signs, fingerspelled words for which there is no sign, fingerspelled words for which a common sign exists, proper names, and gestures or shapes drawn in the air.

Education:
Recently Completed Research

Intra-Personal Variables and Characteristics of Interactions Between Change Agent and Client

Norma K. Clark
Pre-College Programs

In this study, the relative contributions of six intra-personal subsystems of potential adopters of innovations in accounting for attitudes toward change and toward the change agent, and the characteristics of diffusion strategies associated with modifications in attitudes toward change and toward the change agent were investigated.

Administrators and teaching faculty from 103 secondary level programs for the hearing impaired participated in the study. Data for the study were obtained in the following three ways: (a) an initial questionnaire to obtain indices of intra-personal characteristics, (b) a similar followup questionnaire seven months after the initial questionnaire, and (c) the records of interactions between change agency personnel and staff in the 103 participating programs.

Six intra-personal subsystem scores were derived from the 26 intra-personal characteristics using an *a priori* subsystem assignment based on a model of the change process. Multiple regression analyses yielded no substantial predictive relationships for either of the two research questions. Cross validation analyses on the regression analyses indicated substantial shrinkage in already inconsequential predictive power.

Suggestions for future research include: (a) some refinements in the procedures, (b) the use of multiple criterion variables, (c) the use of simulation or gaming techniques to overcome methodological difficulties, and (d) an investigation into organizational and administrative factors which are related to innovation and change in educational settings.

A Psycholinguistic Description of Deaf Children Reading in Sign Language

Carolyn Ewoldt
Educational Research Laboratory
Research Institute

This study described the reading of 25 stories by four deaf readers, ranging in age from 6.11-16.11. The readings were recorded on videotape and subjected to a variety of analyses, including miscue analysis. The cloze procedure was also used, as were a variety of comprehension-assessing techniques.

The study provides detailed information about the reading patterns and strategies exhibited by the readers, as well as a brief description of their language. From this research a tentative model of the reading process of the deaf was proposed and compared to the Goodman model.

Miscue Analysis of the Reading Follow-Through and Non-Follow-Through Children

Carolyn Ewoldt
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Research Institute

A comparison of the reading of 73 Follow-Through (FT) and Non-Follow-Through (NFT) third grade children was made for the purpose of assessing the effects of the Tucson Elementary Education Model (TEEM) Follow-Through Program in Wichita, Kansas. The TEEM program uses a language experience approach to the teaching of reading. The FT children in the study had been in the program for three years, while the NFT children had been instructed by more traditional methods.

A major finding of the study was in the area of teacher attitudes toward children who read in a divergent dialect. FT students who read in dialects different from standard English were consistently rated lower in reading ability by their teachers than were NFT readers, even though FT readers exhibited more efficient correction strategies than the NFT readers. There were not other significant differences between the two groups with regard to reading proficiency.

A Critical Review of Recent Theoretical and Empirical Research Dealing with the Organization of Conceptual Memory

Pamela R. Getson
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Research Institute

In the process of attempting to dissect and define a general concept of human memory, the study of specific aspects of semantic memory has led to several postulated systems that purport to shed light on its organization, representational format, influential properties, and retrieval mechanisms. The purpose of this re-

search is to present and critique some of the recent work in this area which has provided some of the major theoretical bases for the structure of semantic memory.

The common division between proposed theories of semantic organization are the network vs. set theoretic models. In the latter model, the meanings of words are represented by sets of semantic elements. These elements may be images of exemplars or attributes, and the emphasis is on the comparison process of set attributes. Under this model, lexical items are represented by only one means, semantic features, rather than by the two ways of the additive model. Recently, modifications of these theories have been proposed. First, an expansion on the network model which views memory search as activation spreading in parallel from two or more concept modes in a semantic network until an intersection is found. This model was formulated to demonstrate how human semantic processing can be simulated in computerized memory searches. Second, a feature comparison model which expands on the set-theoretic model has been produced. According to this model, each word can be broken down into a set of semantic features and further delineated into defining features which are relatively incidental to meaning.

In this research an attempt is made to explain each of these new theories, point out empirical data of support or refutation, and critique general aspects applying to both.

The Power Efficiency of the Friedman Nonparametric ANOVA Test and the One Factor Repeated Measures ANOVA F-Test

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The Friedman Two-Way Analysis of Variance and the one factor additive model repeated measures analysis of variance were applied to 350,000 unique Monte-Carlo generated data sets. Multivariate normal deviates were premultiplied by a factor of the desired variance-covariance matrix and a constant was added to the scores for the p-th trial to obtain response data of prespecified form. Five hundred sample generations for each of the 700 uniquely specified test cases were made and subjected to the two inferential tests at $\alpha = .10, .05$, and .01. The variables investigated for each test case and their respective values were:

(p) Treatment levels–
3, 5, 7, 9

(n) Sample size–
3, 5, 7, 9, 11, 13, 15

(p^2) Population covariance–
.00, .20, .40, .60, .80

(p) Offset parameter–
.00, .20, .40, .60, .80

Significance testing provided the power information needed to compute estimates of the relative power efficiency of the two tests under each condition. Graphs were prepared for comparison of the power and relative power efficiency of the two tests for representative test cases under varying n, p, $p\sigma^2$, and at each level of α. A separate sequence of graphs was also prepared for illustrating the relative power efficiencies of the tests for representative test cases under conditions of the conjoint variable increase of trials and subjects and of offset and covariance at each of the three alpha levels. These graphs allowed for a condensation of the observed power and power efficiency values, while providing a mechanism for the visual inspection of trends occurring across the varying conditions and alpha levels.

In summary, the x^2 is very similar to the repeated measures analysis of variance additive model in terms of power and relative power efficiency across all variable values considered in this study. Interesting results show the tendency of the power curves to converge under varying conditions of p, $p\sigma^2$, and μp for specific n. This apparent power equivalence of the tests with n at least as large as 15 might serve as a guide when sample size is under experimental consideration for either test. (Such cases are discussed in relative detail.)

In general, it may be concluded that the x^2 test is a viable alternative to the repeated measures analysis of variance additive model and may be recommended for use under certain conditions of n and p for specific situational purposes very frequently encountered when analyzing data resulting from educational research.

Semantic Categorizations of Hearing Impaired Adolescents

Pamela R. Getson
Educational Research Laboratory
Research Institute

The pattern of semantic response production obtained as a result of

"... it has been suggested that the different sense modalities ... may play an important role in the extraction of perceptual information in mathematics."

specific categorical stimuli tend to be similar for various homogeneous groupings of the hearing impaired population. Such groupings in the past have been made according to cultural/racial stratifications and, most popularly, age categorizations. Several texts are available as guides for adult hearing word association and word frequency, but nothing currently exists which provides norms for word frequency typical of the deaf population. In fact, with the exception of the Silverman-Dresner and Guilfoyle vocabulary norms—developed around structures presented by Chall as long ago as 1948—no research has been published to indicate a useful structure of the deaf adolescent's typical semantic production. Knowledge of this pattern and structure could be used to form postulates of the organization of the conceptual memory and information processing of hearing impaired individuals.

In the process of attempting to dissect and define a general concept of human memory, the study of specific aspects of semantic memory has led to several postulated systems that purport to shed light on its organization, representational format, influential properties, and retrieval mechanisms.

Inherent in any of these systems must be the representation and storage of all nonemotive parts of word meanings and the associative properties which then define the availability and use of this information. It has been stated that at a most abstract level, everything is simply defined in terms of some ordered configuration of semantic memory (an individual's knowledge of the lexicon and how he or she utilizes this knowledge in understanding) that has led to a variety of experiments dealing with semantic categorization.

The purpose of a recent study was to investigate the written semantic productions of hearing impaired adolescents in response to categorical stimuli. The first step in a series of studies of semantic cognitive structure of hearing impaired individuals involved the collecting of normative samples of word frequency typicality. Tests were presented to the 550 students enrolled at the Model Secondary School for the Deaf, ages 14-21. The instrument consisted of 11 semantic categories selected for their appropriate structure level as determined in studies with the hearing population. Two sample categories were produced for group practice, and then, the students were requested to provide five examples of each category in an untimed test.

Frequency of the occurrence of each response by categorical semantic sequence was calculated and ordered alphabetically. The complete list is currently available with the cognitive position frequency for each of these words. A summarized frequency-by-category listing for the five highest word frequencies is included.

In addition, the semantic typicality of an instance to a response category (e.g., animal) was calculated and analyzed by response position. A complete rank ordering of frequency and typicality data are available, along with a summary of the five most typical responses for each category instance.

An Investigation of the Spatial Reasoning Abilities of Hearing Impaired Students

Anna R. Hauptman
Educational Research Laboratory
Research Institute

An investigation on the spatial reasoning abilities of hearing impaired students was conducted in an attempt to understand how these spatial reasoning abilities relate to interest and achievement in mathematics. Research evidence suggests that spatial factors are significantly correlated with achievement in mathematics, especially in mathematics where the concepts are essentially spatial in nature. Spatial ability also seems to have a determining effect on a student's aptitude for mathematics.

Spatial reasoning research may have significant importance in the deaf community as it has been suggested that the different sense modalities (e.g., auditory, visual, tactile) may play an important role in the extraction of perceptual information in mathematics. The mobile experience with the environment provides the basis for linear or distance measurement, but the assimilation-accommodation process is visual, auditory, and for short distances, perhaps, tactile. Because hearing impaired children must depend primarily on their visual and tactile senses to a greater degree than hearing children, a different cognitive conceptualization of the spatial process may develop.

Two instruments were adapted for hearing impaired students to evaluate and compare the three major factors which have been identified in spatial reasoning, space, spatial ori-

entation, and visualization. The spatial evaluation instruments used were the Form Rotations Test and the Group Embedded Figures Test.

Data were collected from five classes of mathematics students at the Model Secondary School for the Deaf. All of the students were entering either MA-101 Mathematical Skills class or their first geometry class.

The results indicate that the students scheduled to take geometry (an optional choice for students) scored higher on the Figure Rotations Test than the students scheduled to take MA-101. The geometry groups of subjects also appeared to be more homogeneous than the MA groups of subjects. The results indicated a significant difference exists between the two groups relative to the scores on the test. A comparison was also made between the males and females within both groups. No significant difference appears to exist between male and female subjects in spatial reasoning abilities. This study is the initial phase of an ongoing research project in spatial reasoning abilities of hearing impaired individuals.

THAW (The Historian at Work): An Introduction to Historical Methodology Field Test Study

Anna R. Hauptman
Educaticnal Research Laboratory
Research Institute

The purpose of this study was to field test a new instructional program developed and pilot-tested at the Model Secondary School for the Deaf. THAW (The Historian at Work) curriculum utilizes a problem solving format for understanding the development of historical materials. Developed for high school students, it is intended to help students use the basic terminology and processes necessary in the study of history.

The course was designed so that the student, concomitant with learning the basic historical language and methodology was also learning simple problem solving techniques. It was projected that the problem solving skills practiced would transfer to the students' real-life situation on a long term basis and help them critically examine and effectively judge the events in their everyday lives. The materials were field tested at two sites, the New York School for the Deaf in White Plains and the Scranton School for the Deaf in Scranton, Pennsylvania. Four teachers used the program in eight different classrooms (total = 55 students). The evaluation design had two major components: (a) statistical analysis and (b) qualitative analysis. A discriminant analysis was used to distinguish between the groups of students who were most successful and least successful in the program. A discriminant analysis was also performed to investigate the variables which singly or cumulatively predict the different group membership.

The variable which explained the largest amount of the variance between the groups of students who completed the most THAW units from the group of students who completed the least number of units was the Mathematical Concept Achievement Score. This result can be hypothesized to confirm the validity of the underlying premise of the THAW program that the presentation and the content of the THAW materials are related to the student's ability to analogize problem solving skills. The variable which explained the next largest amount of variance was the communication mode of the student. It would seem to follow that the facility of the student to work with the THAW materials and being able to ask effective questions of both the teacher and the peer group would increase the student's understanding of the materials and would allow for the completion of a greater number of units.

The two other variables which showed up as highly significant were the hearing loss of the student and the student's Reading Comprehension Achievement Score. The discriminate analysis separating the students relative to reading ability as measured by the Reading Achievement Score again showed the Mathematical Concept Achievement Score as an extremely important variable. In this analysis, however, the variable which explained the largest amount of discriminating variance between the two groups was Mathematical Application Achievement Score. Here too, the communication mode of the student showed up as very important, with the onset of the hearing loss of the student also included as an important variable.

Texas Survey

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Office of Demographic Studies
Research Institute

For the fourth year, the Texas Education Agency (TEA) has contracted with the Office of Demographic Studies for the implementation and main-

"Severely to profoundly deaf adolescents (N=120) with a mean age of 16.9 years were used."

tenance of a comprehensive pupil data system for all deaf students in Texas who receive public educational funding. During the 1978-79 school year, the Office collected specific information requested by TEA officials on over 4,500 hearing impaired students in the state. The collaborative project involved the collection of a variety of educationally significant information about the Texas students, including academic achievement scores as determined from the administration of the Special Edition of the Stanford Achievement Test for Hearing Impaired Students (SAT-HI). Individualized student characteristic reports were produced, which included special SAT-HI analyses developed by the Office of Demographic Studies.

In its three years of operation, the Texas Pupil Information System has become an individual tool for educational planning. The project has thus far proven its worth for evaluating the quality of education services for hearing impaired children in Texas and for monitoring the progress of individual students.

The Relationship of the Production of Written English and Reading Ability in Hearing Impaired Adolescents

Thomas N. Kluwin
Educational Research Laboratory
Research Institute

The question of measuring reading ability and language production was examined by use of a path analytic model. Those linguistic factors that would predict reading ability were sought in the hope that such a procedure would suggest what kinds of language activity should receive priority in the instruction of hearing impaired adolescents.

Path analysis assumes that it is possible to make causal orderings between variables. This study assumed that the ability to understand the syntax of English and a knowledge of the vocabulary of English were necessary for reading ability.

Severely to profoundly deaf adolescents (N = 120) with a mean age of 16.9 years were used. The sample was exactly divided on the basis of sex. The average grade equivalent score for reading was 4.4 years. A previously collected written sample and the students' most recent SAT-HI scores were used.

Using a path analytic model was not completely successful in predicting reading ability since almost one-third of the variance was unaccounted for. The various measures of phrase structure rule mastery were differentially effective in predicting syntactic maturity. Syntactic maturity was not as effective as vocabulary ability in predicting reading ability.

Cyclic Patterns of Interaction in the Discourse of Beginning Teachers

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Discourse analysis builds on the basic concepts of language function and language sequence. Language function is based on an interpretation of the intent of the speaker while language sequence is the expression of the various interrelationships that occur within an extended utterance. These two characteristics make discourse analysis an ideal tool for the analysis of classroom verbal interaction. Discourse analysis is descriptively adequate because it is based on a comprehensive theory of language function. Its concern with the sequential patterning of language units makes it suitable for the consideration of a wide range of interaction sequences.

The discourse analysis system used was a modification of a system by Sinclair and Coulthard. The original system was modified to eliminate the redundancies of the earlier system and to make it more reliable. Three levels of discourse were considered: (a) *moves* which are intentional and structural changes within a speaker's turn, (b) *exchanges* which are topically organized sequences of moves, and (c) *transactions* which are functionally related sequences of exchanges. The *move* is comparable but not always identical with an individual speaker's turn. The *exchange* is a set of topically related moves or speaking turns. The *transaction* is a set of exchanges which are directed to a primary function such as instruction or discipline.

The data for this study were gathered by audiotaping 11 Stanford Teacher Education Program (STEP) interns during the first year of their teaching. A total of 33 hours of audiotapes were gathered during the course of a two-week content control unit. The classes were made up of primarily white, middle-class, speakers of English. The audiotapes were transcribed, edited for accuracy and information loss, retyped, and coded. Three coders achieved alpha reliability coefficients of .805 for *moves* and .862 for *exchanges*. The possible pat-

terns of transactions were computed based on the probability of their sequential occurrence.

It was possible to describe four general categories of transactions. There is a *juncture* transaction which mixes questions and information to mark the boundaries in a lesson. The next most probable sequence is the *interactive* where the teacher engages the students directly. *Informative* transactions are relatively rare sequences of continuous teacher talk. *Directive* transactions showed that when teachers do give a direction in a classroom, they tend to be related to a more complex set of directions.

This study suggests that teacher training should contain a middle ground between the "behavioralist" approach that argues for microscopic modifications of teaching behavior because it correlates with affective or cognitive outcomes and a "gestalt" approach toward teaching, that holds up a generalized student attitude as the goal of a wholistic approach to teaching.

Learning Not to Discuss During Classroom Discussion

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A well-preserved and much vaunted principle of language teaching has been that the teacher is a model for the students' speech. The individual speaking turn can be viewed as an "accordion" to which elements can be added or subtracted. It is the structure of this accordion that enhances or detracts from open classroom discussion. The absence of segments of the conversational accordion in the teacher's speaking turn means that students lack necessary information with which to deal when a question is asked. The purpose of this study was to first examine the structure of that conversational accordion and consider whether or not the structure itself influenced classroom interaction, and second, to look at the specifics of questions and their responses to assess the effects of one on the other.

The data for the study were collected from 11 beginning English teachers who taught a content-control unit to ninth-grade students. The teachers were audiotaped for one hour on three occasions during a two-week period.

Two types of analyses were done. The first analysis is a description of the discourse structures used by the teachers and students and included all 33 hours of classroom language. The second analysis used a smaller random set of teachers and observations for an analysis of the relationship between teacher linguistic behavior and student speech by looking at the grammatical structure and the logical level of the teacher's initiations and the pupils' responses.

Using a discourse analysis system, three types of classroom language were examined because they were very indicative of the types of classroom language rules that exist: (a) teacher elicitations, (b) student responses to teacher elicitations, and (c) student informative speaking turns. A secondary analysis of five of the 11 teachers for one observation only was conducted using the Illinois Instrument along with a grammatical categorization of the teacher questions and student responses.

Sequential probabilities were calculated for the internal structure of the three types of classroom language, and the structural variations were then rank ordered. In other words, the individual speaking turn was broken down into functionally discrete units. The probability that, within an individual speaking turn, one functionally discrete unit would follow another was calculated. The sequences of within turn functional units were then rank ordered. The most probable structure for a teacher's initiating of a questioning cycle was for the teacher to simply ask a question. The most probable student response was a simple answer, often less than a sentence in length. Student informing moves had much the same structure as student responses to teacher questions. The results point to the general barrenness of teacher communications. The findings for the secondary analysis suggest that the students would respond more completely to a higher inference question than to a lower inference question. The study concluded that there is a discrepancy between teacher initiatives and pupil capabilities. Students would engage in a more complex linguistic task, but teachers relied primarily on lower level questioning. A serious question is raised as to whether or not the teachers were thwarting the very thing that they were trying to develop: verbal interaction involving a complex intellectual activity.

" . . . teachers and curriculum designers must realize that preposition usage for deaf adolescents is not a simple phenomenon . . . "

Preposition Usage in the Written English of Deaf Adolescents

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In this study, an accounting of the difficulties that deaf adolescents have with the English prepositional system was sought. The study contains a grammatical rather than a chronological developmental model for prepositional usage.

Written compositions were collected from 128 deaf adolescents using the same stimulus for writing. The compositions were coded for preposition usage as syntactically correct, semantically correct, redundant, or omitted. The prepositions used were then grouped by error rate and frequency.

By crossing error rate (high/low) with frequency (high/low), four groups of prepositions are initially described. High error/high frequency prepositions are *for* used in temporal expressions, and *at*, *to*, and *in* as locatives. Low error/high frequency are those prepositions dealing with manner or partitives such as *with*, *for*, *of*. High error/low frequency prepositions were the temporal uses of *at* and *in* as well as *on* used both as a temporal or a locative. Low error / low frequency prepositions seemed to be idiosyncratic to the more competent writers. A contrastive analysis of English and American Sign Language (ASL) suggests that the locative prepositions will present the most difficulties to deaf adolescents since most locative references are contained within the verbs in ASL. Similar to earlier studies, this study found that redundant prepositions were tied to specific sets of verbs.

As users of prepositions, the sample is divisable into three groups: (a) those who have no concept of preposition usage and still use topic-comment grammar for English, (b) those who have the concept of the English preposition but overgeneralize a small set of prepositions, and (c) those who have a relatively good command of the system but exhibit usages similar to foreign speakers not familiar with the selectional restrictions of certain prepositions.

The implications are that teachers and curriculum designers must realize that preposition usage for deaf adolescents is not a simple phenomenon and that various levels for competency will have to be considered when designing instruction. Further research is being done on the special selectional restrictions of the prepositional system.

The Effects of Context on the Use of Articles in English

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The use of context-free sentences in comprehension tests of certain English grammatical structures has been questioned.

The issue that extended context may play an important role in an individual's decisions to use a specific form also is raised. Since the teaching of English to the deaf has often been based on the teaching of specific short patterns, the question is of particular interest not only for test designers but curriculum developers as well. This study examined the effects of extended context on decisions to employ the articles of English. The method of study was the use of rater acceptability of an item as a measure of the stability of that item under different contexts. There were two issues involved, one theoretical and one methodological. The theoretical issue was the effect of context on article usage. The methodological issue was the use of agreement or acceptability ratings to measure that effect.

The material for this study consisted of 125 response items in the form of multiple-choice sentences grouped under five major categories of 25 items each. The material was further organized into paragraphs of five items each. "Context" in this study was defined as the existence of an item within these coherent five-sentence paragraphs. A second set of materials was prepared by generating random sets of numbers so as to scramble the order of the sentences within the topic groupings, that is, five sets of paragraphs were randomly scrambled as 25 sentences and rearranged into five new "paragraphs."

Eight raters were selected to represent several types of language teaching experts. The purpose of the raters was to be adult, native speakers of English who would pass judgement on the grammaticality of a specific form in a context. Raters could respond to an item in the following ways: select alternate choices as being acceptable or respond that both choices were acceptable. Alternate forms of the materials were presented to the raters one month apart.

To establish whether or not there was a statistically significant difference between the responses of the

raters to the context-form and the random-form, Chi Squares were computed by using the frequency of disputed items within a 25-item subsection of the materials.

The study showed that the decision to use articles, particularly the definite / indefinite distinction, is highly context sensitive. The contention that pieces of language longer than single sentences should be used in the testing of deaf children was supported.

The Effect of Experience on the Discourse Comprehension of Deaf and Hearing Adolescents

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Currently, there is a theoretical basis for the question of whether a reader imposes a specific "schema" or structure upon a piece of prose prior to reading it, or if the individual rapidly constructs a network of meanings while reading the material. This research dealt with the question of establishing the existence of differentially generated or imposed structures. A reader of new material either makes the selection of a single meaning to use in building a network or superimposes a schema based on subjective prior experience. A specific operating principle would appear to mediate the reader's choice of mode for dealing with new information. This study hypothesized that previous experience with words in specific contexts tends to prioritize them higher on a selection sequence than other alternatives. It was further hypothesized that a particularly unique and totally submersive environmental set of experiences (such as deafness) would increase the general likelihood of selecting one specific interpretation for a word or a set of words.

The treatment technique employed was that of ambiguous paragraphs presented in a written format. Each piece of discourse was a short paragraph that was amenable to more than one interpretation. Following the paragraph, 10 questions were presented. Each question included one response suitable for each of the two interpretations and two distractors. One paragraph had content which could be interpreted as either a card game or as a music rehearsal. The second paragraph was specially written for this study and could be interpreted as involving either a non-English speaking person lost in a strange city or a deaf student having a problem understanding directions from a teacher. The cards/music and the foreigner/student paragraphs were presented by random order sequence.

Twenty-four hearing adolescents from an integrated reading class were matched with 24 deaf adolescents on the basis of reading ability. Sampling provided for representative inclusion of sex and race in both student groups. No significant differences of paragraph interpretation were found for either sex or race, however, results indicated a significant interaction effect of hearing loss and interpretation of the foreigner/student paragraph. Hearing students interpreted the meaning of this paragraph as the reaction of a lost foreigner, while deaf students selected the student-classroom interpretation. No significant differences were noted for the cards/music paragraph.

This study has two primary implications. The general implication is that it is possible to account for a reader's differential interpretation of prose on the basis of subjective prior experience. An imbedded interpretation is that deaf children have unique life experiences which will consistently effect their cognitive processing style.

The Effects of Selected Errors on the Written Discourse of Deaf Adolescents

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In this study, the use of only measures of syntactic complexity to describe the English processing of deaf children was questioned, and it was found that increasing syntactic complexity alone is not a good indicator of the linguistic competency of deaf children. The purpose of the study was to demonstrate some of the possible features of English that are unrelated to an increased knowledge of syntactic transformations. Two classes of grammatical items were considered; articles and prepositions.

The data for this study were collected from 128 hearing impaired adolescents using the same stimulus for writing. The students were brought together to a central location and shown a videotape. They were to write letters in response to the videotape. The letters were typed verbatim into computer storage. The

stored letters were then coded for grammatical features using a multiple error code.

The students were divided into four groups on the basis of their average sentence length, a rough indicator of syntactic ability. Three types of preposition errors and two kinds of article errors were analyzed.

While the group with the shortest average sentence length was the group that consistently had the highest error rate, the other three groups did not form consistent patterns across the other measures. Analyses of variance with specific linear contrasts failed to establish a direct relationship between the measure of syntactic development and the error types.

The study describes a spiralling developmental sequence for the two grammatical forms with an emphasis on change due to both semantic and syntactic development.

The Pragmatics of Simultaneous Communication in Classrooms for the Hearing Impaired

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Pragmatics is the study of the rules that govern mutual understanding during communication. This study found that the pragmatics of simultaneous communication, use of sign language and spoken language, for classes for the hearing impaired, differs from the pragmatics of normal hearing classrooms in several ways: (a) attention-getting behaviors, (b) attention-holding behaviors, (c) code modification for mutual intelligibility, (d) cross-student attending patterns, and (e) overt turn-taking markers.

This study consisted of 12 hours of videotapes obtained from four secondary school English teachers in a school for the deaf that espouses simultaneous communication. One male and three female normal hearing teachers were videotaped on three occasions within a two-week interval using a multiple camera setup that permitted the videotaping of not only the teachers but the students as well. Transcripts of the classes were made using the video portion only, in order to capture the amount of information that would be consistently available to all students. The transcripts were English glosses of the signs the teachers used.

The difference between attention-getting and attention-holding behavior in normal hearing and hearing impaired classes is that in hearing classes the teachers employ ordinal and temporal adverbs, rhetorical questions, idiosyncratic expressions, and occasionally direct imperatives. In simultaneous communication, the teachers employed in their spoken language the same set of features but would delete most of them from their signs except "okay." Some teachers would employ some of the generalized kinesics that the deaf employ in normal interaction, but the use was not primary to the interaction.

Teachers would modify their signed code to suit what they thought was the communicative skill of their students. Exact Signed English was used only by one teacher and then when she was concentrating on that aspect of the code. This kind of behavior is quite common in communications between differing language groups but raises questions about the efficacy of exact Signed English in the classroom.

It was quite clear that the students did not attend to other students but tended to fixate on the teacher. There was apparently little difference in cross-student attending behavior between students in a simultaneous communication class and reports of student behavior in oral method classes.

There was considerable variation across teachers in the marking of within speaking-turn alterations and speaking-turn boundaries. All teachers occasionally spoke discourse boundary markers without signing them, and some teachers regularly spoke the boundary markers without signing them. For example, a boundary marker in normal hearing classrooms is falling intonation. This is an indication that the "floor is open," and students can participate. Hearing impaired students missed this since there was no sign equivalent for it, nor any apparent parallel kinesic behavior. The result was occasional "lapses" where the teacher waited for the students to participate.

This study supports earlier speculations that differences between the pragmatics of spoken language and sign language would produce unique problems in classroom communication. The immediate implication is that students in classrooms using simultaneous communication may be losing information necessary for their understanding of the content or objectives of a lesson. The function of these behaviors is to organize and emphasize parts of a lesson. Their loss prevents efficient information transmission.

"Deaf subjects found the text-implicit questions to be the most difficult and the text-explicit . . . to be the easiest."

An Investigation of the Alpha Error Rate of Five Approaches to Biased Item Identification

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No definitive evaluation of the Alpha Error Rate of approaches for identifying biased items has been reported, to date. Some researchers have reported results that were applicable to this topic, but their psuedo-group comparison methodology proved to produce tentative results. Consequently, the purpose of this study was to investigate the Alpha error question using simulated data.

The data for the study were generated using a computer program. Five approaches to biased item identification were investigated which included Chi-square, 5 Intervals and Chi-square, and N Intervals. Each approach was applied to the data generated under a zero bias condition for each condition of test length using previously developed decision rules. The results were tabled and the Alpha error rates compared for each of the five approaches.

The results showed the Chi-square techniques to possess the highest Alpha error rates over the conditions of test length, and the Transformed Item Difficulty approach possessed the lowest. Though important in some applications, the Alpha error rate is only one of many considerations in selecting a biased item detection approach. Consequently, practitioners must carefully weigh other characteristics of the techniques according to their purposes.

The Use of the Cloze Procedure as a Measure of Readibility for Deaf Students

Carol LaSasso
Department of Education

The purpose of this study was to investigate the validity and reliability of the cloze procedure as a measure of readability and comprehension for prelingually profoundly deaf students. Subjects for the study consisted of 95 prelingually, profoundly deaf subjects between the ages of 14-18 years and 56 hearing students between the ages of 9-11 years. All subjects scored between 4.0-5.6 on the Intermediate I, Form B, Reading Comprehension subtest of the Stanford Achievement Test.

Four narrative passages, between 500-900 words in length were selected from a supplementary reading series. One passage was computed by the Fry and Dale-Chall readability formulas to be written at a fifth-grade reading level of difficulty. Two passages were computed to be written at a fifth-grade level of difficulty, and one passage was computed to be written at a seventh-grade level of difficulty. Cloze tests were constructed for each of the passages. In addition, a 15-item multiple-choice test was constructed for each of the fifth-grade passages. Five items on each multiple choice test measured comprehension of text-implicit information. Ten items measured comprehension of text-explicit information. Five of the text-explicit questions were randomly selected to be cast as WH questions. The other five text-explicit questions were cast as incomplete statements. The content validity, passage dependency of test questions, and the reliability of the instruments were established prior to collecting the data. Deaf students took a third, fifth, and seventh-grade cloze test and one multiple-choice test. Hearing subjects took only the fifth-grade cloze test and one multiple choice test.

The following conclusions were drawn from the study:

1. The use of the cloze procedure as a measure of readability for deaf students is questionable.
2. However, the cloze procedure appears to be a satisfactorily reliable procedure for deaf students.
3. Cloze tests are not, in the large part, measuring the same thing that the SAT measures.
4. Cloze tests are not, in the large part, measuring the same thing measured by the multiple-choice tests used in this study.
5. Deaf subjects found the text-implicit questions to be the most difficult and the text-explicit questions cast as WH questions to be the easiest.
6. The cloze procedure should not be used as a procedure for making instructional matches between pupils and materials until further research is conducted to affirm its validity as a readability measure.
7. The Fry and Dale-Chall readability formulas should not be used to gauge relative passage difficulty for deaf children until further research affirms the validity of these formulas for deaf students.
8. Care should be taken in interpreting scores on the SAT-HI, cloze tests, or multiple-choice tests of text-explicit or text-

implicit information as indicating comprehension or lack of comprehension for deaf students until further research has been conducted.

National Survey of Materials and Procedures Used to Teach Reading to Hearing Impaired Children

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Department of Education

In this study, answers to the following questions were sought: (a) Which of four major instructional approaches to reading are used most with hearing impaired children at the primary, intermediate, junior high school, and senior high school levels? Approaches considered were basal reader approach, language experience approach, programmed approach, and individualized approach (i.e., where instruction takes place with library books and other materials the child selects himself). (b) Which basal readers are used most by teachers of hearing impaired children? (c) What do teachers see as the major strengths and limitations of these various basal readers? (d) What procedures are used to make appropriate instructional matches between hearing impaired children and materials? (Involved here are decisions about difficulty level of material and reading ability of children.) (e) Where should the focus of future reading research be placed?

Using the mailing list employed by the Office of Demographic Studies for the *Annual Survey of Hearing Impaired Children and Youth*, questionnaires were mailed in October 1976, to the approximately 960 programs throughout the U.S. known to educate hearing impaired children. Followup questionnaires were mailed in January 1977, to programs that had not yet responded. Program directors were instructed to have the person most familiar with the reading program fill out the questionnaire. Most questions required only that the participant check his or her response, however, space was provided for open-ended responses on those items where it was deemed necessary. Data analysis involved descriptive techniques including determination of frequency distributions and tabulations of the responses to the various questionnaire items.

Of the programs surveyed, 65% completed the questionnaires. Useable questionnaires were received from 507 programs. These included 75 of the 79 residential programs, 69 of the known 92 day programs, and 353 of the known 789 day class/other programs. The number of children represented by the participating programs was 34,076.

Seventy-four percent of the programs indicated that they currently used basal readers as either their primary or supplementary method of reading instruction at the various levels. Usage of the language experience approach was indicated by 84% as either their primary or supplementary method of reading instruction.

Approximately 40 different basal readers were cited as being used with hearing impaired children. The basal readers most frequently cited (in descending order) were *Reading Systems* (Scott Foresman), *Bank Street Readers* (Macmillan), *Ginn 360* (Ginn), *Design for Reading* (Harper & Row), and *Open Highways* (Scott Foresman).

Teachers were asked to evaluate basal readers in terms of the following: (a) difficulty and adequate repetition of vocabulary, (b) syntactic complexity, (c) figurative and idiomatic expression load, (d) interest level, (e) concept load, (f) phonics emphasis, (g) supplementary materials, and (h) diagnostic procedures accompanying basal readers. Strengths and limitations of the three most commonly used basal readers were defined in terms of relatively clear consensus among raters, meaning that at least 65% identified a particular characteristic as being a positive feature, not a weakness of limitation of the basal reader. (Summary chart available upon request.)

Procedures most frequently reported as being used to identify reading levels of hearing impaired children were: informal reading inventories, standardized achievement tests, diagnostic tests accompanying basal readers, and the cloze procedure. Only 18% of the programs indicated use of formal procedures for determining the grade level of printed materials. Procedures cited (in descending order of usage) were: the Fry Formula, Dale-Chall Readability Formula, and the cloze procedure.

Responding to the question about where the focus of future research should be, 46% of the programs responded that top priority should be given to developing linguistically controlled materials for deaf children. Twenty-two percent of the programs said that priority should be given to developing diagnostic procedures which could be used effectively with deaf children. However, 29% stated that primary attention should be given to developing instructional approaches for deaf children.

One major finding of this study

was that nearly 75% of the programs educating hearing impaired children use basal readers as either their primary or supplementary materials for teaching reading to deaf children. In light of the findings of Quigley et al. that basal readers contain many linguistic structures incomprehensible to most young deaf readers suggests that inappropriateness of instructional materials may be a major factor in the low reading achievement levels of deaf children.

A second major finding was that only 18% of the programs indicated use of any formal readability procedures with deaf children, and the procedures used were those developed for hearing children. It would appear from this data that teachers are using intuition in selecting materials for deaf children. The validity and reliability of teacher judgment for this purpose is an area which needs to be explored.

The Effect of Question Type on Deaf Students' Demonstration of Reading Comprehension

Carol LaSasso
Department of Education

In view of the finding that questions are frequently used to assess deaf students' comprehension of printed materials and the finding that deaf children have difficulty comprehending questions, it seems clear that an area of needed research is that of question type and its relationship to deaf readers' demonstration of comprehension. The purpose of this study was to examine the effect of two types of multiple-choice questions of text-explicit information (i.e., information which is directly stated in the text). One type of multiple-choice question employed an incomplete statement stem (e.g., ---------- brought the chocolate cake).

Subjects consisted of 95 prelingually, profoundly deaf students from two large residential schools for the deaf who were between the ages of 14-18 years. All subjects scored between 4.0-7.6 on the Intermediate I, Form B Reading Comprehension subtest of the SAT. Two passages, judged to be comparable in terms of content, style, readability, and length were selected from a supplementary reading series. Passages were fanciful tales about Norse gods and evil giants which were judged to have interest appeal for a broad age range of students. Each passage was approximately 750 words in length, and each was determined by the Fry and Dale-Chall readability formulas to be written at a fifth-grade reading level. A 10-item multiple-choice test to text-explicit information was constructed for each of the passages. Half of the items on each test were randomly selected to be cast as WH questions (i.e., questions beginning with who, what, when, where, why, or how). The other half of the items were cast as incomplete statements. Content validity, reliability, and passage dependence of items were established prior to collecting data.

Subjects were tested in group settings within their schools. Half of each group were selected to answer the 10 questions for Passage 1. The other half answered questions constructed for Passage 2.

There were no significant differences in mean scores of hearing students for text-explicit questions using WH question stems and questions using incomplete statement stems. Mean scores for both types of questions were 2.2 out of a possible score of 5. Significant differences between scores using WH question stems and incomplete statement stems were obtained for deaf subjects. Deaf subjects scored significantly higher on questions cast as WH questions than on questions cast as incomplete statements. (Mean score for WH questions was 2.7. Mean score on questions cast as incomplete statements was 1.8.)

Within the limitations of the study pertaining to test length and the nature of the sample, the findings suggest that deaf students appear to find WH questions to be easier than questions cast as incomplete statements. One implication of this finding is that teachers wishing to assess a deaf child's reading comprehension should use WH questions instead of incomplete statements.

Drug Knowledge Survey

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A survey questionnaire was developed in order to ascertain the extent and depth of drug knowledge held by a number of undergraduate and preparatory students in the college. It was found that drug knowledge was generally below expectations for both groups in several areas of basic drug information.

The study analyses indicate that more time, energy, and other resources should be spent on preparing the hearing impaired adolescent so that a better understanding of drugs

" . . . hearing learners of sign often interchange signs with similar meaning without regard to their contextual and situational environment."

and their probable effects on the mind and body might be gained.

Situational Reinforcement: An Innovation in the Teaching of Sign

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The major objectives of this research were to:

1. Conduct preliminary research on the use of Situational Reinforcement as an instructional method for the teaching of sign by investigating the already existing literature in use in teaching sign language;
2. Compile the accepted signs and idiomatic expressions of ASL into their appropriate situational context, i.e., the sign or idiom ought to fit the situation in which it is to be used;
3. Produce an eventual Situational Reinforcement (SR) Handbook of Signs and Idioms for use by learners and teachers of sign, both hearing and deaf, thus, helping to establish a positive language attitude toward the language of sign;
4. Minimize the margin of error between extremely similar signs and idioms which are used only in certain context or situations;
5. See if such research has facilitated interactions between this project and other research projects and departments now in existence, namely, the Linguistics Research Lab and the Office of Sign Language Programs.

A hearing person who becomes an educator of the deaf should be a continual learner of sign language. He or she should be constantly aware of the difficulties the new learner of sign faces when confronted with the first weeks of orientation, and for weeks or even years thereafter.

Furthermore, it is very evident when trying to master sign language that language reversal often occurs. This is to say, hearing learners of sign often interchange signs with similar meaning without regard to their contextual and situational environment.

It is being suggested here that such errors could be eliminated or reduced by approaching the teaching of sign from a different point of view, that of SR (Situational Reinforcement).

This innovation could also lead to a positive language attitude on the part of the learner, something often suppressed by the presentations of the signs and idioms now offered, for example, to the incoming faculty. Situational Reinforcement is not only different in its teaching techniques but also in its objectives, organization of material, and even more importantly, in the rapidity with which students are able to increase their ability to communicate in the target language. It is an attempt, devised for the teaching of languages to non-native speakers in 1969, to create a language learning system built primarily on psychological principles using strict linguistic principles, but in a different framework. Therefore, it would be a feasible approach for at least the novice signer to have such exposure to SR for it certainly would alleviate the psychological strain imposed upon him or her through present methods of instruction.

Since the SR approach regards language as a total experience, the material organized and taught would have to be presented in such a way as to enable the learner to understand and become familiar with real communicative ideas rather than merely parroting a collation of isolated structures in an artificial setting. As a living system of ideas, both concrete and abstract, the learner should therefore not be limited in his/her acquisition by a body of material devoid of any relationship with real life situations. Thus, as the student begins to accomplish new utterances within their proper situational context, he or she will become capable of generating communicative ideas when and where they should appear, without hesitation due to uncertainty of sign or situation.

SR has been a proven method of spoken language learning for several years now, and, it is felt that it certainly would be an innovative and psycholinguistically sound approach in the learning of sign, as sign language is a living language.

The Effects of Pictorial and Verbal Instructional Materials on the Operational Performance of Deaf Subjects

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This research provides an objective comparison of the effectiveness of pictorial and verbal information in printed instructional materials with deaf subjects. Four types of instructional formats were prepared, varying in proportion of pictorial and verbal information: (a) all pictorial; (b) predominantly pictorial, with

some ancillary verbal information; (c) all verbal; and (d) predominantly verbal with some ancillary pictorial information. Each format was given to a separate group of deaf college student subjects. The instructional materials described sequences of operational procedures to be carried out by subjects on a complex control-display apparatus. Performance was measured by task completion time and error rate. Results showed that when both performance variables are considered, the best instructional format consisted predominantly of pictures with some ancillary verbal information. The format consisting entirely of pictorial information produced short task completion times but relatively high error rates. The all verbal and predominantly verbal formats generally yielded low error rates but longer task completion times. Since these results are consistent with related studies conducted with hearing subjects, the research has general implications for the development of instructional materials and job performance aids in education and rehabilitation.

Visual Processing of Sequentially Presented Letters by Deaf and Hearing Subjects

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Department of Psychology

Letters were presented sequentially in the same position on a display to determine the visual processing capabilities of deaf and hearing Ss, as measured by letter identification accuracy. Four and six-letter sequences, composing meaningful words, pronounceable nonsense words, and scrambled letter strings were displayed at rates of 300, 150, and 75 msec per letter. Results showed no significant differences in letter identification accuracy between deaf and hearing groups for meaningful words and nonsense words, but hearing performed better than deaf Ss with scrambled letter strings. For both groups, identification accuracy was highest with meaningful words and lowest with scrambled letter strings, with performance inversely related to sequence length and presentation rate. Results were interpreted in relation to the visual experience of deaf Ss in processing the rapid sequential patterns of fingerspelling and the difference between deaf and hearing Ss in English language competence and letter encoding strategies.

Residential Schools for Deaf Students in the United States, 1970-78

Arthur N. Schildroth
Office of Demographic Studies

Data on enrollment, ethnic background, additional handicapping conditions, and age of pupils reported to the Office of Demographic studies by 62 public residential schools for deaf students between 1970 and 1978 have been examined. There was a 9.8% enrollment decline at these special educational schools over the eight-year period, a decline which paralleled the decrease in the number of school-age children in regular schools across the nation. Regionally, decreases occurred in all areas except the South, which, while reporting an overall gain for this period, experienced losses for the 1977-78 and 1978-79 school years; the heaviest enrollment declines were in the Northeast and North Central Regions. Signs of enrollment stabilization have appeared in the West since 1976-77.

Most of the enrollment decline in these schools was due to the loss of white students, especially notable in the Northeast and North Central Regions. This national decline in the number of white hearing impaired students in the 62 schools was a partial reflection of what has been and will be occurring, for some time at least, in the nation at large, where the black population is growing more rapidly than the white, especially in the age group under 14 (Bureau of the Census, 1979a).

In regard to multiply handicapped children enrolled in these schools, there has been a 3.3% increase nationally in the number of such children between 1970 and 1977. The increase was reported by all regions except the South. Brain-damaged children and children with severe visual problems showed the largest percentage increases in all regions of the country for the seven years.

Nationally, the 62 schools enrolled 6.2% more students aged 18 years and older in 1977-78 than in 1970-71, while enrollment of children 13 years and younger declined 6.5% during this period. This pattern in the age categories at these 62 residential schools—an increasing number of older children and fewer younger children—is also paralleled in the regular school population.

Although there appear to be certain patterns in the data, these patterns are certainly not unalterable. This is especially true where enroll-

ment is concerned; the National Center for Education Statistics (1978), basing its projections on Bureau of the Census figures, estimates that there will be an increase in the number of children at the regular elementary and secondary schools across the country beginning in 1985. Since this projection is based on national fertility rates, it is likely that residential school enrollment will also be affected. Minorities will represent higher percentages of the total population through the 1980's, and it is estimated that one-fifth of the U.S. population will be black or Hispanic by 1990, with an even higher percentage in the younger age categories. According to these same projections, the population of the Northeast and North Central Regions—with the possible exceptions of Maine, New Hampshire, and Vermont—will grow less rapidly than the South and West. Federal and state initiatives to identify more handicapped children according to the mandate of P.L. 94-142, especially in light of the discrepancy between the estimated total population of these children and the actual number identified by the states so far, may affect enrollment in all special education programs.

The data should be considered in the context of these projections, limited, and fallible as they necessarily must be. Enrollment figures and tables of numbers give only a partial picture of what is happening in the nation's schools and communities. They say nothing about the quality of education or needs of individual deaf children which are the primary concern of educators and which are rooted in a host of individual characteristics and personal qualities. It is these needs that the residential schools have responded to in the past. How well they meet these needs in the future will determine the role of the residential schools in the education of deaf children.

A Survey of 1971-77 Graduates of the Model Secondary School for the Deaf

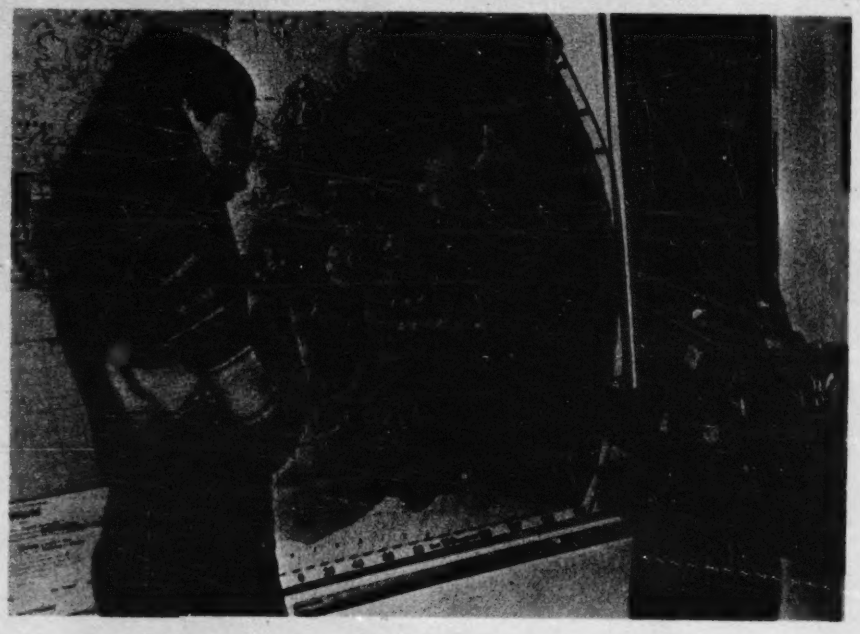
Tad Uno
Cheryl Petty
Educational Research Laboratory
Research Institute

The concerns of high school graduates, whether hearing or hearing impaired, are relatively universal in that they tend to focus on two major areas, higher education/training and employment. Collegiate opportunities for hearing impaired graduates are probably more limited than for their hearing peers; This is due to a variety of factors including level of academic preparation and communication difficulties. There are, however, a limited number of colleges and universities with educational and vocational programs designed for hearing impaired students. The employment status of hearing impaired individuals is also probably marginal when compared to the total work force. The purpose of this study was to examine the current and past educational and vocational activities of seven consecutive graduating classes from the Model Secondary School for the Deaf.

Questionnaires were sent to 139 graduates from the 1971-77 graduating classes out of the entire target population of 155. (Two graduates had died and addresses were unknown for 14 graduates.) Data analysis, performed on 105 returned questionnaires (76% return rate), resulted in the following: (a) approximately 70% of the graduates have attended or are now attending postsecondary education programs in the United States. Attendance at Gallaudet College accounts for 47% of the graduates followed by 12% at the National Technical Institute for the Deaf (Rochester Institute of Technology, U.S.); (b) the unemployment rate was less than 9%, and the remainder of the graduates were either attending school, working, or doing both; (c) 75% of the employed graduates were in technical, paraprofessional, and clerical positions; and (d) the annual income of the graduates was comparable to the income of the U.S. deaf population which is only about two-thirds of the average income of hearing workers.

A cursory extrapolation of these results to the general population of hearing impaired high school graduates suggests that a significant percent of hearing impaired graduates are attending postsecondary education/training programs, and their employment is not too different from those of hearing workers. A closer examination, however, indicates that such interpretations must be made with some caution. First, the reader must keep in mind the nature of the MSSD itself in that it was created for the purpose of serving as a "model" for other schools for the deaf in the United States. The MSSD graduate is exposed to exemplary/experimental programs and materials which are under continuous development and validation and subsequently made available for use to other educational systems. Second, inspection of the employment situation of the hearing impaired graduate, such

as type of job and annual income, immediately shows a disparity between the hearing and hearing impaired worker. Corrective measures must continue to be taken in educational and political policies if hearing impaired individuals are to benefit from the opportunities available to all individuals.



Attitudinal and Motivational Characteristics of Students Enrolled in a Special Education Teacher Preparation Program

Tad Uno
Educational Research Laboratory
Research Institute

The selection of particular areas of academic or vocational preparation has been recognized to be based largely on an individual's experiential history. Aside from the limitations beyond an individual's control, such as physical or mental disabilities, career goals may be associated with certain identifiable forces. Most notable are the humanistic and the mechanistic forces. In the former, career selections are influenced by a humanistic orientation concerned directly with the delivery of human services, while the latter is more involved in theoretical and technological developments.

The purpose of this study was to examine the characteristics of students currently enrolled in a university based teacher preparation program in a special education department.

Three standardized inventories, the Edwards Personal Preference Schedule (EPPS), Cattell 16PF, and the Minnesota Teacher Attitude Inventory (MTAI) were administered to 115 senior special education students during their practicum experience in student teaching. This sample accounted for 95% of all student teachers during the fall academic quarter.

A correlational analysis resulted in significant relationships among the various subscales of the EPPS, 16PF, and the MTAI. Personal and attitudinal characteristics such as interpersonal relationships, achievement/success motivation, and affective expressions were generally more pronounced than aggressive, objective, and nonpersonal characteristics. Academic performance was not related to any personality or attitudinal characteristics.

A questionnaire was developed to measure students' attitudes toward the field of special education as well as to collect information on their experimental background. The questionnaire was mailed to 480 special education students who had completed a minimum of one course offered by the special education department at the university. The results of Experiment II were based on a sample of 321 students (67% return rate).

Approximately 68% of all special education students responding to the questionnaire had one or more handicapped persons in their family background (as compared to approximately 10% of regular education majors acknowledged to have a special family background in a previous study). An analysis of variance indicated that students with special family backgrounds were significantly less positive in their attitude toward agencies designed to assist

"Factors such as perceived physical health and home life were positively correlated with self concept . . ."

handicapped persons than students without a special family background. Students with special backgrounds also were more involved in volunteer programs for the handicapped. Freshman, regardless of their family backgrounds, were also significantly less positive than sophomores, juniors, or seniors. There was no significant difference in attitude toward the fields of special or regular education between students with or without a special family background. Additional analyses of parental occupation, age, number of siblings, grade point average, and other factors showed no significant difference based on either academic grouping or special family background grouping.

Additional studies are needed to examine the significance of experiential and academic variables in relation to teaching behavior. As the demand for quality teachers of exceptional students is anticipated to decline during the 1980's, it becomes more important that a system be developed for the identification of students with high probabilities of being effective classroom teachers of exceptional children.

Creativity and Self Concept of Mentally Retarded Adolescents

Tad Uno
Educational Research Laboratory
Research Institute
Gary Leonardson
Public School System
Whitefish, Montana

Investigations into the self concept and creative behavior of mentally retarded adolescents have generally indicated that they have lower self concept and verbal creativity than nonretarded adolescents. However, since creativity can be expressed and measured in a variety of ways, it is important to recognize that mildly retarded individuals have not been shown to differ significantly from nonretarded individuals on the basis of figural measures of creativity. Experience appears to be more important than intelligence or verbal skills when figural expressions of creativity are measured. The present study examined the relationship between self concept and figural creativity in the educable mentally retarded adolescent.

Torrance's *Thinking Creatively With Pictures* (Form B) and the Piers-Harris *Children's Self Concept Scale* were administered to 44 educable mentally retarded students enrolled in special secondary education programs for the mentally handicapped.

All correlations among the four creativity measures, fluency, flexibility, originality, and elaboration were statistically significant. Contrary to the hypothesized relationships, there were no significant positive correlations between self concept scores and the creativity measures. In addition, the Torrance figural measures were negatively, but not significantly, correlated with self concept. This relationship appears to be due to the fact that retarded students are traditionally instructed in convergent thinking strategies, and that self concept will most likely increase as convergent thinking skills increase.

Factors such as perceived physical health and home life were positively correlated with self concept but were negatively correlated with creativity. This relationship may be explained by the assumption that negatively perceived physical health and home life necessitates the development of divergent thinking in order to respond to or cope with personal and home life difficulties. The results suggest that the relationships among creativity, self concept, and personal experiences operate in similar ways at both ends of the intellectual continuum.

The Creative Behavior of Hearing Impaired, Educable Mentally Retarded, and Nonretarded Hearing Children

Tad Uno
Educational Research Laboratory
Research Institute

A major consideration of all educational and training programs for exceptional individuals is the development of skills and competencies for their students in order to enable them to function as independently as possible in our society. In the past, attention has been focused on the teaching of specific situational behaviors. Regardless of the rationale, exceptional persons, such as the hearing impaired and the mentally handicapped, were assumed to be incapable of learning concepts and tasks routinely taught to nonhandicapped persons.

More recently, educators have become aware of the need for greater behavioral flexibility in their students, in spite of the presence or absence of a handicapping condition. This realization has been exhibited in increased interest and activity in the creative process and in methods

of assessing and developing an individual's creative potential.

The purpose of this study was to examine the creative potential of hearing impaired children, educable mentally retarded children, and nonhandicapped children using verbal and nonverbal assessment instruments. Since the existing evidence indicates that hearing impaired children and adolescents are generally deficit in normal language development, it was hypothesized that verbal creativity in these groups would be significantly lower than for a comparable group of students with no hearing impairment. On the other hand, nonverbal creativity measures would not be significantly influenced by difficulties in language development.

The subjects consisted of four groups of children. One group was composed of educable mentally retarded children with mental ages of 4.5-6.5 years. A second group was selected from an elementary school program for hearing impaired children. The third and fourth groups were, respectively, nonhandicapped rural elementary school children and children in a university affiliated school program. All children in the second, third, and fourth groups had chronological ages of 4.5-6.5 years. Intelligence test scores were not available for these students. A modified form of the Torrance Picture Test of Creativity was used for the nonverbal measure, and the Starkweather Test was used for the verbal measure of creativity.

The results indicated that there were no significant differences among the groups based on the four creativity indices of the Torrance Test. Significant differences were noted, however, when using the verbal measures. Children with university affiliated parents performed significantly better than the other three groups. There was no significant difference between the hearing impaired and the rural school children, but both were significantly more creative than the educable mentally retarded children.

Consistent with the existing literature, the results indicate that creativity is a multifaceted phenomenon. Creativity exists in various forms and can be measured if appropriate instruments are developed and administered with an understanding of their limitations. The results also demonstrate that creative potential is not completely determined at conception but that environmental determiners may be influential in the final expression of creativity. Educators must be cognizant of the role of researchers, curriculum developers, and educational planners in providing students with educational programs to optimize their potentials for personal, academic, and vocational development.

Education: Current Research

Reading Habits and Preferences of Beginning Deaf Post-Secondary Students

Jeffrey P. Braden
Michael P. Ralph
Department of Psychology

The deficiencies of deaf secondary school graduates in reading achievement/language ability is a well documented fact. However, there is no research in the area of what these people read, how often they read, and what factors relate to their reading behavior.

In order to select recent secondary school graduates likely to engage in reading behavior, beginning students at California State University Northridge, Delgado College, National Technical Institute for the Deaf, St. Paul Technical and Vocational Institute, and Seattle Community College will be surveyed via a questionnaire, to ascertain their preferred reading material and frequency of reading behavior. Material related variables to be investigated are: (a) types and titles of materials that are selected for reading, (b) how often such materials are read, (c) topics of materials, (d) presence/absence of a television or movie counterpart, and (e) ratio of picture space to word space in periodicals. Demographic variables to be investigated are: (a) sex, (b) program type previously attended, (c) geographic location of previous program, (d) degree of hearing loss, and (e) socio-economic status. The demographic characteristics will be used to create subgroups for frequency distributions, and will be used to predict reading material variables in a multiple regression design in order to establish significant relationships and identify reading materials likely to be of high interest and use within varying subgroups of hearing impaired individuals.

Results of the study, with implications for program types and recommendations directed towards implementation of these findings in programs for the hearing impaired at secondary and post-secondary levels, will be summarized in a report to be published and mailed to programs, schools, and other agencies serving the hearing impaired.

A Descriptive Analysis of Reading Behaviors of Hearing and Hearing Impaired Children

Carolyn Ewoldt
Educational Research Laboratory
Division of Research

The purpose of this study is (a) to compare the signed and/or oral reading of hearing impaired and hearing children reading the same stories to determine whether the two groups of readers make similar miscues (unexpected responses to the print), (b) to discover how their strategies for reading are similar and different, and (c) to determine the effects of the stories' grammars on the recall, influences, and misconceptions exhibited by both groups of readers. The subjects are 53 hearing students from Wichita, Kansas and Anne Arundel County, Maryland, ages 8-10, in addition to 20 hearing impaired students from Kendall School, ages 8-14. Audiotapes of the hearing children's reading retelling of stories were transcribed and verified by hearing researchers. Videotapes of hearing impaired children's oral and/or signed reading and retelling of the same stories are being transcribed and verified by deaf researchers. The stories used in the study have been analyzed according to a story grammar technique. Analysis of "miscue clusters" will follow a procedure previously used in formative research for the Scott, Foresman Publishing Company.

A Descriptive Analysis of Reading Behaviors of Hearing Impaired Children with Different Educational Backgrounds

Carolyn Ewoldt
Educational Research Laboratory
Division of Research

A study is being made to compare the reading strategies of hearing impaired children whose educational background has been primarily oral with the reading strategies of hearing impaired children from a total communication background for the further purposes of identifying changes in the strategies exhibited by the oral group following their entry into a total communication school and at six-month intervals thereafter. Seven hearing impaired oral children, ranging in age from 10-14, and 13 total communication students, ages 8-14, are the subjects. Videotapes of the children's oral and/or signed readings and retellings are being transcribed and verified by deaf researchers. Miscue analysis of the reading will follow a taxonomy, and an analysis of retellings will follow the procedure. Videotape interviews of the students have also been conducted to discover what perceptions students have about reading and what they believe desirable reading strategies to be.

A Longitudinal Study of the Reading of Two Hearing Impaired Students

Carolyn Ewoldt
Educational Research Laboratory
Division of Research

The purpose of this research is to study changes in reading strategies and growth in reading proficiency of two hearing impaired students, girls aged 6.11 and 15.11 at the beginning of the study. Videotapes of the students' signed readings and retellings of stories have been made at yearly intervals for the past four years. This annual data collection will continue for as long as the students are available. The videotapes are being transcribed and verified by deaf researchers. Miscue analysis of the readings will follow a taxonomy, and an analysis of retellings will follow the procedure.

The Relationship of Caption Content Comprehension and Prior Semantic Information

Pamela R. Getson
Educational Research Laboratory
Research Institute

Previous work by a variety of researchers in a number of different applications points to the conclusion that not only are the variables of film type and student reading level important for understanding the content of visual media presentations, but also the specific semantic abilities of the student. A simple measure of the student's reading comprehension and/or vocabulary level through the use of a standardized test (e.g., SAT-HI) can only partially account for the variability between the actual and predicted comprehension scores found for a group of students using various captioned film and format styles. Work completed on factors which delineate successful captioned content acquisition indicate that the most important single facet may be the students' acquired or preinstructed vocabulary. The purpose of this study is to determine the effects of prior semantic facility with specific caption imbedded vocabulary which is dependent for understanding of the film content.

Subjects were randomly selected from the total student body of a high school for the hearing impaired. Subsequent random assignment of students to film condition and vocabulary condition provided the sequencing for a three-way repeated measures analysis of variance under the conditions of preteaching and no preteaching vocabulary. Students viewed four separate one-hour film sequences. Vocabulary knowledge was assessed through paper and pencil administrations of tests pre and posttreatment. Separate instrumentation was used to determine individual levels of the captioned content which was acquired.

Subsequent analysis of the data will lead to results indicating:

1. Relative importance of preteaching or prior information for adequate understanding of captioned format materials;
2. Differences between formats and the understanding of necessary imbedded vocabulary;
3. Suggested instructional modes to be utilized by teachers in conjunction with certain kinds of captioned instructional media;
4. Considerations which should be included in guidelines for the edited or rewritten versions of captioned films which are of different formats and/or will be used in various classroom situations;
5. Format for studies which will replicate (or refute) necessary semantic considerations for the generation of adequate edited captioned materials for high school level viewers.

Undergraduate Instructional Methods

Irving King Jordan
Department of Psychology

This project is an attempt to identify the best method for offering undergraduate instruction in general psychology. Previous research (presented at the American Psychological Association Convention) comparing a traditional lecture format with the Personalized System of Instruction (PSI) showed that the students in the PSI class did somewhat better, as measured by the final examination. Current work includes modification of the PSI system and refinement of the instructional materials.

Visual Rhythms as an Aid to Reading

Irving King Jordan
Department of Psychology

This project, being done in collaboration with James Martin from the University of Maryland, is an attempt to determine whether deaf

" . . . an excellent opportunity for a cross-cultural examination of educational services for hearing impaired students."

students can benefit from reading practice in which words are presented dynamically, syllable-by-syllable on a television screen. Previous research by Dr. Martin has shown that hearing children do benefit from such practice. Research subjects will be recruited from the Model Secondary School for the Deaf.

Annual Survey of Hearing Impaired Children and Youth

Michael Karchmer
Arthur Schildroth
Office of Demographic Studies
Research Institute

The Office has completed its data collection activities for the 1978-79 Annual Survey of Hearing Impaired Children and Youth. Over 1,100 schools and programs were contacted and invited to participate in the survey; approximately 750, with an enrollment of 50,000 students, agreed to take part. Data are now being entered on the computer, and preliminary tabulations are expected before the end of 1979. Further analyses of this large data base and further uses of it for research projects—for population estimates and sampling, for correlation with the achievement test data collected in our 1979 longitudinal study, etc.—will be made during 1980.

Canadian Survey

Michael Karchmer
Linda Petersen
Office of Demographic Studies
Research Institute

After almost three years of planning, the Canadian Survey of Hearing Impaired Children and Youth is now a reality. The survey was completed in the spring and summer of 1979 by means of an experimental OPSCAN questionnaire form, available in both French and English; it is hoped this will be the model for future Office of Demographic Studies survey instruments. Responses, which have been received from approximately 75 programs reporting data on about 5,000 students, are now being edited and processed for computer entry. The data from this survey will provide an excellent opportunity for a cross-cultural examination of educational services for hearing impaired students.

Kendall School/Office of Demographic Studies Collaborating on Behavior Inventory

Michael Karchmer
Linda Petersen
Office of Demographic Studies
Research Institute

The Office of Demographic Studies has been cooperating with members of the Educational Research Laboratory of the Kendall Demonstration Elementary School in the development of a Social-Emotional Assessment Inventory for deaf students. Designed for use by teachers, the inventory yields a profile summarizing an individual student's behavior along several dimensions of social and emotional adjustment. Data from the research edition of the inventory, which has been administered to 2,500 students across the United States, will be used for the development of norms. The final edition can be expected in the near future, perhaps as early as spring 1980.

Louisiana Survey

Michael Karchmer
Sally O'Rourke
Stephen Wolk
Office of Demographic Studies
Research Institute

In order to establish a system to monitor the educational services available to hearing impaired and deaf-blind students, the Louisiana State Division of Special Educational Services has contracted with the Office of Demographic Studies to conduct a survey of all programs in that state serving hearing impaired children. This survey has now been completed, with the Louisiana programs reporting a total of 1,575 students. A final report of the survey results is now being prepared and will be sent to Louisiana officials upon its completion.

A Comparative Study of Leader Behaviors of Deaf and Hearing Supervisors

Ronald E. Sutcliffe
Division of Business Affairs

The purpose of the study is to compare the leadership behaviors of deaf and hearing supervisors as perceived by their subordinates. Based on the 12 dimensions of leader behavior as described by the Leader Behavior Description Questionnaire, Form XII, the overall hypothesis will be tested on each of subscales involving leader behaviors. Most lead-

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ers would expect effective communication between themselves and their subordinates. The subordinates will respond with their perception of the behaviors of their supervisors.

The subjects will be supervisors employed at the college.

New Nationwide Achievement Test Study

Stephen Wolk
Office of Demographic Studies
Research Institute

The Office of Demographic Studies has completed the testing phase of a longitudinal study of the academic achievement of hearing impaired students. This study has involved the testing of approximately 5,000 students enrolled in 75 special educational programs throughout the United States. Many of these same students were first tested in the Office's 1974 national achievement test standardization program when the Special Edition of the Stanford Achievement Test for Hearing Impaired Students was introduced. This testing program will give us our first thorough look at the long term growth patterns of the academic achievement of hearing impaired children. The data compiled from this longitudinal study will also serve as updating of the norms established for the SAT-HI in 1974, norms that have been used by educators in interpreting the academic performance of hearing impaired students.

Mental Health Service in Programs for Hearing Impaired Children

Anne B. Spragins
Department of Psychology

A national survey of professionals providing mental health service in programs for hearing impaired children is underway at present as a collaborative effort with the Office of Demographic Studies. The survey was distributed in March 1979, and approximately 800 returned forms are in the process of being analyzed. The primary purpose of the survey is to gather information on the professionals providing mental health services on programs for hearing impaired children. A secondary purpose is to assist the school psychology program organize its curriculum in a way that best meets the needs of school mental health practitioners.

Psychological Services Survey

Office of Demographic Studies Staff
in collaboration with
Anne B. Spragins
Department of Psychology

In cooperation with Gallaudet's School of Psychology Training Program, the Office of Demographic Studies conducted a survey of professionals who provide psychological services to hearing impaired students in spring 1979. This survey has now been completed; an unexpectedly high number of responses have been received, and the comments that have accompanied the completed forms suggest that professionals are very interested in the results of the study and most willing to cooperate. A report on this project will be available.

Education: Projected Research

Reading, Writing, and Hearing Impairment

Carolyn Ewoldt
Educational Research Laboratory
Research Institute

Research is being planned into the reading processes of hearing impaired children which will involve more extensive use of discourse analysis procedures and generative semantics. In addition, a modified cloze procedure study and a study of print awareness in preschool hearing impaired children are being planned.

Two taxonomies for analysis of hearing impaired students' writing are in a developmental stage, and studies using these taxonomies are being considered.

Multidimensional Scaling of Response Latencies for Semantic Processing of the Hearing Impaired

Pamela R. Getson
Educational Research Laboratory
Research Institute

A number of recent studies have been directed at explicating the structure of semantic memory and the nature of the operations that take place when retrieving information from long term memory. Since it has been demonstrated that hearing impaired children process language differently from their hearing counterparts, there is an indication that they are using differing procedural steps in their memory search, retrieval, and comparison processes. This study proposes to identify comparison pathways used by hearing impaired children, in order to produce a diagnostic instrument based on a deaf model of semantic processing (featural or network). Determination of the most efficient mode of curriculum presentation for the student could then be made available to all instructional personnel.

All programming and analysis will be accomplished through use of an interactive computer system to facilitate equivalence of stimulus presentation and a rigid control for the collection of the dependent measure of reaction time. Subjects will be selected at random from a large secondary high school for the hearing impaired. Stimulus input will be organized within the calculated ranges for the frequencies and typicality and/or similarity ratings ascribed to the semantic production norms of previous research with this population of students.

Vocabulary Production Norms for the Deaf

Pamela R. Getson
Educational Research Laboratory
Research Institute

As currently planned, this project will deal with the collection of vocabulary produced by deaf individuals at the levels of preschool/elementary, secondary, and adult. Data collection will proceed through the use of a matrix sampling methodology for the collection of free writing samples derived from a specified set of situational constructions from which writing would be solicited. A manual of such norms could then be utilized by any writer of materials for the deaf. Demographic variables relating to age, hearing loss, reading ability, etc., will be included for additional cross-referencing in an appendix format for this booklet. Possible uses include:

1. Item writers use when constructing new tests;
2. General assessment of items already in use for a specified level of student;
3. Vocabulary guidelines useful to captioners/editors in the process of rewriting materials or editing original manuscripts for a specified level or particular age grouping; and
4. Teachers developing new lessons which require the use of partial print information.

Preceptual Salience and the Deaf Child

Mary Hockersmith
Model Secondary School for the Deaf

This study is designed to investigate the sensitivity to color, shape, or size among deaf children. The hearing child of 2-3 years is expected to choose shape more often than size or color. At 3-6 years, the same child will more often choose color. However, after age 6 years, shape will again become the predominant choice. There is little information as to the features which are salient for the deaf child.

The literature has shown that learning tasks are accomplished more quickly and with greater accuracy when the salient dimension is relevant to the task solution. This study proposes to look for the relationship between perceptual salience among deaf children and scores of reading comprehension as measured by

the Stanford Achievement Test as normed for the deaf.

The specific questions to be addressed by this research are: (a) Do deaf children demonstrate the same age-related patterns of perceptually salient dimensions as those reported in the literature for hearing children? (c) Are there differences in male and female deaf children's salience patterns? (c) What is the relationship between high shape salience and scores of reading comprehension for deaf children between the ages of 6 and 16 years?

A test of perceptual salience will be administered to deaf children enrolled in an elementary school for the deaf. Children will be tested at each of the ages represented by the departments within the school (4-14 years). The Mums Assessment Program (MAP) subtest of perceptual salience will be given individually to the students. The reading comprehension subscores will be collected in order to examine the relationship between shape salience and reading comprehension.

Implications of Perceptual Research on Deafness for the Educational Development of Deaf Persons

Horace N. Reynolds
Department of Psychology

Deafness might be expected to have some effect on perceptual processes involving the other sensory channels. On the one hand, deafness might generally exert a detrimental effect on functioning in the other sensory modalities, as a result of disruption of normal intersensory relationships and/or neurological impairment affecting the other sensory systems. By contrast, deafness might result in the development of superior capabilities in certain visual, tactual, and other sensory functions, as a form of compensation for loss of hearing. A review of much of the existing research on the perceptual effects of deafness has found that the majority of studies show either perceptual equivalence or deficiency for deaf in comparison with hearing subjects. There is very little evidence of perceptual compensation for deafness. However, this may be due to a lack of research on perceptual abilities which might serve a compensatory function in deaf persons.

Some of the educational implications of existing research on the perceptual effects of deafness will be briefly examined. Promising areas for further perceptual research with deaf subjects will be proposed, and the possible implications for the educational development of deaf individuals will be examined. Research areas to be considered will include (a) visual recognition and memory for stimuli presented simultaneously vs. sequentially, (b) peripheral visual attention, (c) visual imagery in cognition, (d) perception of pictorial information, and (e) tactual object or shape perception.

Peripheral Visual Attention in Deaf and Hearing Subjects

Horance N. Reynolds
Department of Psychology

The purpose of this research is to determine whether deaf and hearing subjects differ in ability to attend to and report the characteristics and location of stimuli presented tachistoscopically (brief exposure time) in the peripheral visual field. Peripheral vision may be important to deaf persons in maintaining awareness of events taking place in the peripheral visual environment, because such information cannot be detected auditorily. Greater attentiveness to peripheral visual stimulation might be particularly important to deaf subjects during periods of central (foveal) visual concentration, e.g., reading, communicating in sign. Consequently, it is hypothesized that deaf subjects will be superior to hearing subjects in reporting the location and characteristics or identity of peripherally presented visual stimuli.

An experiment is currently being planned to investigate this hypothesis by presenting stimuli briefly in varying locations in the peripheral visual field while subjects are monitoring a central (foveal) display. Deaf and hearing subjects will be compared in terms of accuracy in reporting the location and characteristics or identity of peripheral stimuli.

Administrative Placement of Hearing Impaired Children

Roslyn Rosen
Special School of the Future

Research on the administrative placement of hearing impaired children is being planned for the near future.

Books in Preparation

Indian Sign Language: Dictionary and Phonological Analysis

James Woodward
Madan Vasishta
Susan De Santis
Linguistics Research Laboratory

A dictionary of Indian Sign Language is presently being prepared as well as an analysis of the formational aspects of Indian Sign Language, especially as they relate to universal and unique features of sign languages. The investigators spent two months in Delhi, India, collecting and photographing signs from the Delhi variety of Indian Sign Language. The dictionary will be printed by the All India Federation of the Deaf in Delhi.

The dictionary has important applied and theoretical uses. It can be used to help set up training programs for interpreters for Indian Sign Language and to help establish sign language training programs for interested individuals such as hearing parents of deaf children. It may also have some effect in allowing Indian Sign Language to be used in the educational system for deaf individuals. In addition to these practical benefits the dictionary will be of invaluable use to researchers wishing to do comparative studies of sign languages since Indian Sign Language is not closely related to European Sign Languages.

Teaching Reading to Hearing Impaired Children

Thomas N. Kluwin
Carolyn Ewoldt
Educational Research Laboratory
Research Institute

The purpose of this book will be to provide teachers of the hearing impaired in conventional schools for the deaf and teachers in regular schools faced with the mainstreaming of deaf pupils with a sourcebook for reading instruction. The volume will contain a review of research on hearing impaired children's reading and summaries, notes, and instructional suggestions for teaching reading to hearing impaired children.

The research articles will be grouped under two general categories: the hearing impaired reader and the reading text. In the first section, questions on the nature of hearing impairment which are thought to affect the individual's ability to read will be addressed. It will also include articles concerning questions of linguistic- and non-linguistic-related impediments to reading. In the second section some specific issues of textual features which can impede the success of hearing impaired readers will be featured. This section concerns the more generalized questions of formats or types of printed presentations.

Textile Laboratory Manual

Kaye Oman
Department of Home Economics

This manual was written for use in the textiles class taught in the Gallaudet College Home Economics Department. It was developed because of the lack of apropriate laboratory manuals in this field. It consists of 14 laboratory exercises related to topics presented in the class lectures, including the following: textile physical properties, natural and man-made fibers, yarns and methods of fabric construction, dyeing, printing, finishes, detergency and stain removal, textile labeling and legislation. The manual insures a logical progression of study from learning general textile properties through fiber and fabric analysis to performance characteristics.

In each laboratory experience the student is presented with the learning objectives, the materials, and the procedures to perform. For example, for the topic "Natural Fibers," students study the characteristics and performance of the natural fibers cotton, flax/linen, silk and wool. Analysis is made through examination of the fibers' visual appearance, burning characteristics and chemical solubility. On the basis of these experiments, students are asked to summarize some of the fiber properties and make end-use product recommendations for each of the fibers.

Intermediate Sign Language

Willard J. Madsen
Sign Communication Department

This book is a unique aproach to using American Sign Language (ASL) and English in a bilingual setting. The book will contain 25 fully-illustrated lessons in ASL, all based upon practical conversational topics. Each lesson has illustrated sentence patterns signed by seven

deaf characters. Opposite each signed sentence is the ASL gloss and suggested translations into English. Beginning each lesson is a brief paragraph which may be signed by the instructor to introduce the new vocabulary and to serve as initial receptive practice for the students. The rest of each lesson includes a glossed vocabulary review, translation exercises from ASL to English and from English to ASL, grammatical notes and suggested activities. Substitution drills and other exercises will also be included to provide for ample practice material. Also included in the text will be a series of practice tests related to given lessons, a bibliography, and a glossed alphabetical index.

The text is designed as a textbook in ASL for sign language students. The book might also be useful to deaf students who understand ASL but have deficiencies in English usage. The use of deaf characters throughout the book will provide some insight into deafness and the deaf community.

Advanced Sign Language

Willard J. Madsen
Sign Communication Department

This book will be a companion to *Intermediate Conversational Sign Language*. It contains 25 additional fully-illustrated lessons in American Sign Language (ASL) and English in a bilingual setting. The same seven characters are portrayed to provide further insight into the deaf community with a number of topics related to organizations and activities well-known to people involved with deafness, including clubs, associations, and theaters of the deaf. Again sentence patterns in ASL are illustrated by character drawings on one page with glossed sentences and suggested English translations appearing on the opposite page. The format of the lessons is basically the same as in the intermediate text. Grammatical notes and explanations guide the student's growth in acquiring skill in understanding and using ASL as opposed to English. Glossed vocabulary reviews, translation exercises from ASL to English and from English to ASL, practice test material, a bibliography, a glossed alphabetical index, and suggested activities are also included. The text provides study material in English usage for deaf students who understand ASL as well as for the sign language student needing a better grasp of ASL usage. Publication is expected in 1981.

Medical Care for Deaf Patients

The National Academy of Gallaudet College

Intended for physicians who see deaf patients for any kind of health care, the book focuses on deaf people, rather than pathologies of the ear. Its five chapters, contributed by physicians at major medical centers, include Early Identification of Hearing Loss in Infants and Children; Psychosocial Aspects of Early Deafness; Pediatric Management and Parent Counseling; Physician/Patient Relationship with Early Deaf Adults; and Adventitiously Deaf Patients. The book is still in the developmental stage, with publication expected in 1981.

A Guide to College/Career Programs for Deaf Students

Brenda Rawlings
Office of Demographic Studies
Research Institute

Since the 1978 edition of this college and career guide was released, over 30,000 copies have been distributed free of charge. The *Guide* lists and describes more than 60 postsecondary programs offering special services to deaf students. It is written to aid students, teachers, counselors, and parents of hearing impaired students in selecting appropriate postsecondary schools and programs. It may also be of assistance to those already enrolled in a postsecondary program but who are considering changing to another program. The *Guide* describes in some detail those programs which responded to a survey and which met specific minimum requirements and lists other programs which did not meet those requirements but do have deaf students enrolled. In addition to describing the special services offered by each program, the book also outlines the vast range of careers in which deaf students are presently majoring. A new edition is being prepared presently.

The Deaf Student in College

Division of Public Services

This folder containing materials for administrators of universities, colleges, and other postsecondary institutions was published with funds provided by the W. K. Kellogg Foundation. A booklet, *The Deaf Student in College*, presents information

which a postsecondary institution needs in order to provide appropriate and adequate services to deaf students. The text describes issues such as Federal mandates, "critical mass," communication in the college classrooms, and the impact of deafness on a deaf person's speech and language. The second volume in the folder, *A Guide to College/Career Programs for Deaf Students*, describes in some detail existing programs serving deaf students.

With the endorsement of the American Council on Education three copies of *The Deaf Student in College* were sent to the president of each accredited college and university in the United States for referral to the institutions' administrations, libraries, and officers for handicapped students.

Structured Tasks for English Practice (STEP)

Division of Public Services

This is a series of English workbooks designed especially for deaf youth and adults to assist them in writing better English. The STEP series is based on research which analyzed the errors made most frequently in the writing samples of deaf adults enrolled in the Gallaudet College Adult Basic Education classes in the fall of 1974. The workbooks concentrate on the English constructions which were often used incorrectly in written language.

The books in the series include: *Articles; Verbs: Past, Present, and Future; Nouns; Pronouns; Conjunctions; Adjectives and Linking Verbs; Adverb Clauses; Prepositional Phrases;* and *Infinitives and Gerunds.* The 10th book, *Writing Sentences*, will be available in the summer 1980. The workbooks are intended to be used in conjunction with classroom lectures or for independent study. The self-instructional format provides opportunities for frequent student response, immediate feedback and self-pacing. A diagnostic test and *Teacher's Resource Guide* are available for use with the series.

Basically Yours

Division of Public Services

This book is a resource guide of lesson plans and worksheets written by experienced adult basic education teachers. Pages within the looseleaf notebook are intended to be duplicated for use with students. Topics include: Reading Readiness, Reading, Vocabulary and Idioms, Grammar, Writing, Reference Skills, Manual Communication, Mathematics, and Life Skills. Teachers may submit new lesson plans to be added to the book.

A copy of *An Annotated Bibliography of Books and Materials for Adult Basic Education Classes with Deaf Adults* is included in the notebook. It is a listing of commercially available materials which have been evaluated for their usefulness with deaf adults (illiterate to advanced students). The bibliography describes the materials, where they may be obtained, and their approximate cost.

Visual Vocabulary Skills

Division of Public Services

This series of workbooks is designed to develop vocabulary skills in deaf students of all ages. The workbooks contain black and white photographs of common things in the environment for the student to identify. Each workbook comes with a list of suggested answers. At present the following workbooks are available: People, Vehicles, Tools & Appliances, Places, Recreation, and Rooms. Other workbooks in the series will be available at a later date. The topics under development include the following: foods, clothing, actions, and nature.

Interpreter Training: The State of the Art

The National Academy of Gallaudet College

This document, developed from a conference of leading professionals in the field, covers the interpreter, the interpreter trainer, policy and administration, and research. It also includes an indexed list of training materials and a comprehensive annotated bibliography on interpreting.

Proceedings: Understanding the Political Process

The National Academy of Gallaudet College

This book is a comprehensive coverage of a workshop aimed at enhancing the political skills of the leaders of the deaf community. Its purpose

was achieved by simulating a Congressional Appropriations Committee Hearing and requiring the participants to assume the roles of Congresspeople, lobbyists, special interest group representatives, expert witnesses, and concerned citizens.

Living with Deaf-Blindness: Nine Profiles

The National Academy of Gallaudet College

This book presents nine deaf-blind individuals. They tell about their lives—their schooling, jobs, and families; their plans, fears, and hopes. They are people from widely divergent backgrounds who became deaf-blind at various ages and from various causes. In relating their experiences and feelings, they provide glimpses into many worlds—growing up deaf and attending state residential schools, losing one or two senses gradually or suddenly, adjusting to loss and limitations, and associating with family, co-workers, professionals, and friends.

Manual/Simultaneous Communication Instructional Programs in the Educational Setting

Gallaudet College and National Technical Institute for the Deaf

This book contains papers presented at a workshop to promote an understanding of the process involved in planning, implementing and evaluating manual/simultaneous communication instructional programs for students, parents, teachers, and staff.

Working With Words

John Canney
Philip Goldberg
Diane O'Connor
Department of English

Working With Words is a new way of learning vocabulary. The goal of this series of workbooks is not only to learn the meanings of words but also how to use these words in sentences.

The format of each lesson includes: definitions and examples of 10 key words (including parts of speech); word roots, prefixes, and suffixes; using the words. For every unit of five lessons there is a pretest, a review lesson, and a posttest. The workbooks are scheduled for publication in the summer 1980 by Gallaudet College Press.

Practical English Structure

Marcia Bordman
Patricia Byrd
Bernadene Schlien
Department of English

This five-volume set of books offers an intermediate course of English language instruction. Students who use these lessons should already be familiar with a great many English structures. The lessons review systematically the construction of many grammatical items which students have studied previously, introduce new ones, and offer extensive practice in what the grammatical constructions mean and how to use them. The approach is similar to that used to teach English as a second language but with emphasis on the concepts and problems which seem to plague hearing impaired students. These books are scheduled for publication in the spring 1981 by Gallaudet College Press.

Teachers of the Hearing Impaired in the United States

Edward E. Corbett, Jr.
Maryland School for the Deaf
Carl J. Jensema
Office of Demographic Studies

This book provides descriptive statistics on the nation's teachers of hearing impaired children in elementary and secondary schools or programs, including: personal characteristics, education, certification, professional affiliations, experience, positions, duties, salary, communication, and hearing impairment. The profile of the teachers developed in the book can be used by teachers, school administrators, and teacher training programs for improvement of the teaching population. This book is scheduled for publication in the fall 1980 by Gallaudet College Press.

A Hug Just Isn't Enough

Carren Ferris

This book for parents of deaf children will be available in summer 1980, published by Gallaudet College Press. The book contains approximately 80 photographs of deaf children and quotes from their parents concerning various topics such as goals they have for their children, communication at home, frustrations, etc. The manner in which the parents candidly share their expectations, experiences, and concerns will

be useful to parents, graduate students, teachers, and other people interested in deafness.

Deaf Heritage: A Narrative History of Deaf America

Jack R. Gannon
Office of Alumni and
Public Relations

This book published by the National Association of the Deaf brings together the highlights of "the deaf experience" in America the last 100 years. It begins with an overview of the early years of deafness from 1812 to 1880. Following this introduction each chapter covers 10 years from 1880 to 1980. Special topics such as deaf artists and their work, deaf humor, deaf peddlers, sports, founders of schools for the deaf, poetry, and anecdotes are featured. The book contains approximately 100 pages of pictures. The hardcover edition will be available in the summer of 1980, and a paperback edition will be published later. The book could well be used as a text for courses in deaf culture, required reading in teacher preparation and counseling programs, and a welcome reference for any kind of study on deafness and deaf people.

Sign and Culture: A Reader for Students of American Sign Language

William C. Stokoe
Linguistics Research Laboratory
Research Institute

This book, scheduled for release in June 1980, contains selected papers that have appeared in *Sign Language Studies* from 1972 to 1979. The material was chosen to give students, educators, teachers, and parents as well as the intellectually curious, useful information. Following an introductory essay, "The Study and Use of Sign Language," the papers are arranged in four sections.

The first section addresses the broad question, "What is sign language?" Its six chapters range from the specific sociolinguistic process called pidginization to the general linguistic and semiotic nature of encoding information into sense-perceptible output. The second section looks at a crucial part of the whole age span in the community using American Sign Language. Section three examines the bicultural bilingual situation and describes how most deaf people choose to live in contact with others like themselves, forming a special subculture shaped by signed unspoken language. The fourth section shows how the roots of sign expression lie deeper than those of spoken expression, and hence that gestural behavior may have shaped the internal parts of language more and earlier than did vocal output.

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